Final
Environmental Assessment

Combat Information Transport System Upgrade

Vandenberg Air Force Base
California

21 July 2006

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FINDING OF NO SIGNIFICANT IMPACT

Combat Information Transport System Upgrade
Vandenberg Air Force Base, California

Pursuant to provisions of the National Environmental Policy Act (NEPA), 42 U.S. Code 4321 *et seq.*, implementing Council on Environmental Quality (CEQ) Regulations, 40 Code of Federal Regulations (CFR) 1500-1508, and 32 CFR Part 989, *Environmental Impact Analysis Process*, the U.S. Air Force (Air Force) conducted an assessment of the potential environmental consequences associated with the upgrade of the Combat Information Transport System (CITS) on Vandenberg Air Force Base (AFB), California.

Vandenberg AFB is headquarters to the 30th Space Wing (30 SW), the Air Force Space Command unit that operates Vandenberg AFB and the Western Range. Vandenberg AFB operates as a missile test base and aerospace center, supporting west coast space launch activities for the Air Force, Department of Defense, National Aeronautics and Space Administration, and commercial contractors.

Vandenberg AFB is located on the south-central coast of California, approximately halfway between San Diego and San Francisco. The 99,100-acre base extends along approximately 35 miles of the Santa Barbara County coastline.

The CITS provides an integrated, high bandwidth network, consisting of network equipment and fiber optic cable connectivity. The Air Force considers CITS to be part of the national defense system. Upgrading the CITS would augment existing distribution infrastructures and install new fiber optic cable to deliver a high speed, broadband, robust digital information transport system. A CITS upgrade would integrate existing data systems and provide the capability to integrate these systems with planned voice, video, imagery, and sensor systems, including classified systems. The upgrade would also improve reliability via dual connectivity and eliminate existing network maintenance issues.

The Environmental Assessment (EA) (incorporated as an attachment to this finding) considered all potential impacts of the proposed action and alternatives, both as a solitary action and cumulatively in conjunction with other projects at Vandenberg AFB. The EA analyzes activities that have the potential to affect both the natural and human environment, and provides guidelines for the proposed activities to avoid adverse environmental effects.

PROPOSED ACTION

The Proposed Action consists of an infrastructure installation that would include 468,520 feet (ft) (or 89.7 miles) of new/replacement conduit/cable, along 259,520 ft (49.2 miles) of trenching, installation of 82 new handholes, and maintenance and upgrade work at 438 existing manholes, handholes, and pullboxes.

The installation consists of the subsurface placement of 0.75-inch cables inside tubular conduits ranging in size from 1.25 inches to four inches in diameter. Fiber optic lines would be installed by plowing, trenching or boring the lines depending on the topography and presence of sensitive resources.

All construction areas would be backfilled to grade and returned to a like condition by replacing asphalt, concrete, landscaping, or earthen materials. Soil stockpiled during excavation activities would be either used as backfill, used at another project if accepted by that project's contractor, used at the Vandenberg AFB landfill if the capacity for daily cover material is available, disposed of in an on-base borrow pit if approved by the 30th Civil Engineer Squadron, or transported to an appropriate disposal facility off Vandenberg AFB.

The CITS route would remain primarily along paved roads, with portions of segments placed along unpaved or gravel roads, dirt access roads, and established trails. The fiber optic cable would be installed in non-road (paved/unpaved/or trail) areas at two main sites and at three smaller sites as described in Section 2.1 of the EA. Installation of new fiber optic infrastructure and augmentation of existing fiber optic lines would occur over approximately a 12-month period.

Implementation of the No-Action Alternative would result in no upgrade to the CITS. Without the CITS upgrade, there would not be any increase in the speed and bandwidth of the CITS, and reliability would not be improved via dual connectivity. Additional facilities would remain unconnected to the system and therefore lack integrated high bandwidth networking options. Additionally, network maintenance issues would not be resolved. As the CITS is considered to be a part of the national defense system by the Air Force, this system would not be operating at its full potential.

SUMMARY OF FINDINGS

The analyses of the affected environment and environmental consequences of implementing the Proposed Action presented in the EA concluded that with implementation of the project and monitoring measures as described in Section 2.1.6, no significant effects should result to Air Quality (Section 4.1), Human Health and Safety (Section 4.5), and Transportation (Section 4.6). In addition, the EA concluded that Earth Resources, Environmental Justice, Land Use, Pollution Prevention, Socioeconomics, and Solid Waste would not be affected by the Proposed Action.

While the Proposed Action would not affect land use, portions of the CITS route fall within the California Coastal Zone. In accordance with the Coastal Zone Management Act, Vandenberg AFB submitted a Negative Determination to the California Coastal Commission (CCC) on 21 June 2006. Notification of concurrence is anticipated from the CCC by 21 July 2006.

No cumulative adverse impacts will result from activities associated with the upgrade of the CITS, when considered in conjunction with recent past and future projects within the project area (Section 4.8).

Four areas of environmental consequences evaluated in the EA were determined to have the potential to result in less than significant impacts to the environment.

Biological Resources

One riparian/wetland area was identified adjacent to the proposed route. However, this area would be bored, avoiding any adverse effects to this sensitive habitat. Vernal pools within the proposed route occur along Tangair Road and along 13th Street. For these areas, the proposed fiber optic cable would be installed on the roadways to avoid adverse effects to this sensitive habitat.

The federally endangered Gaviota tarplant (*Deinandra increscens* ssp. *villosa*) was documented or has the potential to occur at various locations along the proposed route as well as at a number of existing and proposed manholes, handholes, and pullboxes. Pre-construction surveys at specific sites to definitively confirm the presence of Gaviota tarplant will provide the opportunity to implement site-specific measures that should avoid significant adverse effects on this species (Tables B-1 and B-2 of Appendix B). In addition, adherence to the construction constraints described in Section 2.1.6 should prevent potential adverse effects.

The federally threatened vernal pool fairy shrimp (*Branchinecta lynchi*) occur in vernal pools present along the proposed fiber optic cable route as well as at a number of existing and proposed manholes, handholes, and pullboxes. However, because installation of the proposed fiber optic cable would avoid all vernal pools, this species would not be adversely affected by the proposed project.

The Migratory Bird Treaty Act provides federal protection to native avian species, their nests, eggs, and unfledged young. Construction activities associated with the proposed project would result in short-term noise disturbances, which may temporarily disrupt foraging and roosting activities of individual birds, or disrupt breeding activities during the breeding season (March through late July). Pre-construction surveys will be completed at specific sites prior to the start of project activities as described in Tables B-1 and B-2 of Appendix B. No significant impacts are anticipated.

In addition to the measures described in Section 2.1.6 of the EA, all terms and conditions contained in the Biological Opinion (1-8-06-F-21) issued by the U.S. Fish and Wildlife Service on July 20, 2006, will be implemented to ensure potential minor adverse effects to natural resources are minimized or avoided. No significant impacts to biological resources are anticipated (see EA Sections 3.2 and 4.2).

Cultural Resources

Twenty-nine cultural resources were found within or adjacent to the 60-foot wide Area of Potential Effects along the proposed route. Thirteen of these resources are known historic properties, while 16 remain unevaluated for the National Register of Historic Places.

- One resource at El Rancho Oeste Road will not be affected since the road is built on approximately six feet of imported fill.

- One resource on the south side of Umbra Road will be avoided by trenching no deeper than 12 to 18 inches below surface, not to exceed the depth of the road bed.
- Twenty resources will be avoided by trenching along the centerline of Point Sal Road, Bear Creek Road, Coast Road, and Station Road, no deeper than 12 to 18 inches below surface, not to exceed the depth of the road bed.
- At Honda Creek, one resource will be avoided by installing the line on a dirt bridge over the creek
- Five sites will be bored under with a 60+ meter buffer around each site.
- One resource will be avoided by trenching in paved portions of Pine Canyon Road with excavation not to exceed the depth of roadbed gravels for the extent of site boundaries.

Archaeological monitors at specific locations will be present during some activities to ensure adverse effects are avoided. No significant impacts are anticipated on cultural resources (see EA Sections 3.3 and 4.3). Implementation of the measures described above and in the EA (Section 2.1.6) should prevent the potential for minor impacts from occurring. On 16 December 2005, the Air Force requested concurrence from the State Historic Preservation Officer with a No Adverse Effect determination to historic properties.

Hazardous Materials and Hazardous Waste

Hazardous materials, such as petroleum, oil and lubricants used for equipment maintenance, along with any hazardous wastes generated during the project will be managed in strict compliance with all applicable regulations, including 30 SW Plan 32-7086, *Hazardous Materials Management Plan*, and 30 SW Plan 32-7043A, *Hazardous Waste Management Plan.* This should avert the potential for adverse impacts to the environment as a result of the presence and use of hazardous materials and hazardous waste during the Proposed Action. Vandenberg AFB will not be responsible for hazardous materials and/or waste created by the project proponent.

Because sections of the proposed fiber optic cable route would be installed within boundaries of some Areas of Interest (AOIs), Areas of Concern (AOCs), and Installation Restoration Program (IRP) sites, there is the potential for encountering pollutants during implementation of the Proposed Action, as well as inadvertent interaction with IRP equipment and operations. In addition, many of the AOIs and AOCs have not undergone surveys or investigations, or results are not yet available. Therefore, the potential for contact with contaminants considered a risk to human health is unknown at this time. Implementing the measures described in Section 2.1.6 of the EA should prevent any potential adverse impacts from occurring.

No significant impacts are anticipated from hazardous materials and wastes (see EA Sections 3.4 and 4.4) with the implementation of the measures detailed in Section 2.1.6.

Water Resources

Because the project would disturb an area greater than one acre, a National Pollutant Discharge Elimination System (NPDES) permit would be required to protect water resources. The NPDES Permit requires the development and implementation of a Storm Water Pollution Prevention Plan that includes preventative maintenance measures for equipment, spill prevention and response measures, sediment and soil erosion control measures, and identifies measures for management of runoff. Implementing best management practices should prevent adverse effects as a result of construction activities, i.e. stormwater/wastewater discharges, and erosion. In addition, implementing a Frac-Out Contingency Plan should preclude adverse effects in the event of a frac-out during boring activities. Lastly, installation of the fiber optic cable line within 12 to 18 inches of the surface at two specific locations in Segments 7 and 8 where groundwater has been measured at shallow depths should prevent any adverse effects to groundwater resources (see EA Sections 3.7 and 4.7).

No significant impacts are anticipated with the implementation of the measures described in Section 2.1.6 of the EA.

FINDING OF NO SIGNIFICANT IMPACT

Based upon our review of the facts and analyses contained in the attached EA, conducted in accordance with the provisions of NEPA, the CEQ Regulations, and 32 CFR Part 989, we conclude that the Proposed Action should not have a significant environmental impact, either by itself or cumulatively with other projects at Vandenberg AFB. Accordingly, an Environmental Impact Statement is not required. The signing of this Finding of No Significant Impact completes the environmental impact analysis process.

FINDING OF NO SIGNIFICANT IMPACT
CONCURRENCE PAGE

Final Environmental Assessment for the Upgrade of the Combat Information Transport System, Vandenberg Air Force Base, California

I concur with the Finding of No Significant Impact (FONSI)

Environmental, Safety, and Occupational Health Council Approval:

JACK WEINSTEIN
Colonel, USAF
Commander, 30th Space Wing
Vandenberg AFB, CA

26 Jul 06
Date

Judge Advocate Approval:

DOUGLAS G. MURDOCK, Lt Col, USAF
Staff Judge Advocate
Vandenberg AFB, CA

26 July 06
Date

Squadron Approval:

RICHARD N. COTE, P.E.
Deputy Base Civil Engineer
Vandenberg AFB, CA

25 Jul 06
Date

Final

Environmental Assessment

Combat Information Transport System Upgrade

Vandenberg Air Force Base

California

Prepared for:

Department of the Air Force
30th Space Wing, Civil Engineering Squadron
Vandenberg Air Force Base, California

21 July 2006

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Acronyms and Abbreviations

30 CES	30th Civil Engineering Squadron
30 CES/CEV	30th Civil Engineering Squadron, Environmental Flight
30 CES/CEVC	30th Civil Engineering Squadron, Environmental Flight, Compliance Office
30 CES/CEVPN	30th Civil Engineering Squadron, Environmental Flight, Natural Resources
30 CES/CEVR	30th Civil Engineering Squadron, Environmental Flight, Installation Restoration
30 SW	30th Space Wing
30 SWP	30th Space Wing Plan
30 SW/SE	30th Space Wing/Safety Office
ACM	Asbestos containing materials
AFB	Air Force Base
AFI	Air Force Instruction
AFOSH	Air Force Occupational Safety and Health
AHPA	Archaeological and Historic Preservation Act
AIRFA	American Indian Religious Freedom Act
Air Force	United States Air Force
AOC	Area of Concern
AOI	Area of Interest
APCD	Air Pollution Control District
APE	Area of Potential Effect
ARPA	Archaeological Resources Protection Act
bgs	Below ground surface
BMP	Best Management Practice
BTEX	Benezene, toluene, ethylbenzene, xylene
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
Cal EPA	California Environmental Protection Agency
Cal OSHA	California Occupational Safety and Health Act
CAP	Collection Accumulation Point
CARB	California Air Resources Board
CCA	California Coastal Act
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CITS	Combat Information Transport System
CNDDB	California Natural Diversity Data Base
CO	Carbon monoxide
COC	Contaminant of Concern
Council	Advisory Council on Historic Preservation
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
dB	Decibels
DOD	Department of Defense
DOT	Department of Transportation
EA	Environmental Assessment
EO	Executive Order
EOD	Explosive Ordnance Disposal Flight
EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act

ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FFSRA	Federal Facilities Site Remediation Agreement
FONSI	Finding of No Significant Impact
GPS	Global Positioning System
H_2S	Hydrogen sulfide
Hazmart	Hazardous Materials Pharmacy
HAZWOPER	Hazardous Waster Operations and Emergency Response
HDD	Horizontal directional drilling
HDPE	High density polyethylene
HMMP	Hazardous Materials Management Plan
HSWA	Hazardous and Solid Waste Amendments
HWMP	Hazardous Waste Management Plan
IRA	Interim Removal Action
IRP	Installation Restoration Program
ITS	Information Transport System
LAT	Landfill Access Ticket
L_{eq1H}	One-hour average sound level
LOS	Level of Service
MBTA	Migratory Bird Treaty Act
MFH	Military Family Housing
MTBE	Methyl *tert*-butyl ether
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
National Register	National Register of Historic Places
NCA	Noise Control Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
North Base	North Vandenberg Air Force Base
NO_2	Nitrogen dioxide
NO_X	Nitrogen oxides
NOAA Fisheries Service	National Oceanic and Atmospheric Administration National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
O_3	Ozone
ODC	Ozone depleting chemicals
OSHA	Occupational Safety and Health Act
P2	Pollution Prevention
Pb	Lead
PCB	Polychlorinated biphenyl
$PM_{2.5}$	Particulate matter 2.5 microns or less in diameter
PM_{10}	Particulate matter 10 microns or less in diameter
PPA	Pollution Prevention Act
ppm	Parts per million
PPMP	Pollution Prevention Management Plan
POL	Petroleum, oil and lubricants
psi	Pound per square inch
PVC	Poly-Vinyl Chloride
RCRA	Resource Conservation and Recovery Act
ROC	Reactive Organic Compound
RWD	Report of Waste Discharge
RWQCB	Regional Water Quality Control Board
SAIC	Science Applications International Corporation
SAP	Satellite Accumulation Point
SEL	Sound exposure level
SHPO	State Historic Preservation Office

SLC	Space Launch Complex
SO_2	Sulfur dioxide
SO_4	Sulfates
South Base	South Vandenberg Air Force Base
SWRCB	State Water Regional Control Board
STS	Space Transportation System
SWPPP	Storm Water Pollution Prevention Plan
TCE	Trichloroethylene
TPH	Total petroleum hydrocarbons
TPHg	Gasoline
TSCA	Toxic Substances Control Act
$\mu g/m^3$	Micrograms per cubic meter
U.S.	United States
USAF	U.S. Air Force
U.S.C.	U.S. Code
U.S. EPA	United State Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	Underground storage tank
UXO	Unexploded ordnance
Vandenberg AFB	Vandenberg Air Force Base
VOC	Volatile organic compounds
VTRS	Vandenberg Telemetry Relay Station
WDR	Waste Discharge Requirement

1. Introduction: Purpose of and Need for the Proposed Action

This Environmental Assessment (EA) evaluates the potential environmental impacts associated with the upgrade of the Combat Information Transport System (CITS). The proposed project entails installing subsurface fiber optic cable to service critical communication needs for facilities on Vandenberg Air Force Base (AFB) in Santa Barbara County, California.

The National Environmental Policy Act (NEPA) and the Council on Environmental Quality (CEQ) regulations require lead agencies to evaluate the potential impacts of federal actions on the surrounding environment. The United States Air Force (Air Force) is the lead agency for NEPA compliance on the proposed project.

This EA has been prepared in accordance with the NEPA of 1969, as amended (42 United States Code [U.S.C.] 4321 et seq.); as implemented by CEQ Regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508); and 32 CFR Part 989.

1.1. Purpose of and Need for the Proposed Action

CITS provides an integrated, high bandwidth network solution, consisting of network equipment and fiber optic cable connectivity. Upgrading CITS would augment existing distribution infrastructures and install new fiber optic cable to deliver a high speed, broadband, robust digital information transport system. A CITS upgrade would integrate existing data systems and provide the capability to integrate these systems with planned voice, video, imagery, and sensor systems, including classified systems. The upgrade would also improve reliability via dual connectivity and eliminate existing network maintenance issues. The CITS upgrade would provide network connectivity to 222 communication closets located in 197 buildings, establishing critical communication sustainability for Vandenberg AFB's air and space programs while supporting its missions. The Air Force considers CITS to be part of the national defense system.

1.2. Project Location

Vandenberg AFB is headquarters for the 30th Space Wing (30 SW). The Air Force's primary missions at Vandenberg AFB are to launch and track satellites in space, test and evaluate America's intercontinental ballistic missile systems, and support aircraft operations in the Western Range. As a non-military facet of operations, Vandenberg AFB is also committed to promoting commercial space launch ventures.

Vandenberg AFB is located on the south-central coast of California, approximately halfway between San Diego and San Francisco (Figure 1-1). Vandenberg AFB covers 99,099 acres in western Santa Barbara County (USAF 2004a) and occurs in a transitional ecological region that includes the northern and southern distributional limits for many plant and animal species. The Santa Ynez River and State Highway 246 divide Vandenberg AFB into two distinct parts – North Base and South Base.

The Proposed Action would include installing approximately 90 miles of fiber optic cable at various locations throughout North and South Base (Figure 1-2). Typically, fiber optic cable and infrastructure would be installed subsurface along paved roads, unpaved or gravel roads, dirt access roads, and established trails. Staging areas would be established near Buildings 488, and 1871 (Figure 1-2). As described in Chapter 2 of this EA, *Description of the Proposed Action and Alternatives*, fiber optic cable would also be installed in open space at two main areas, with three additional small locations.

1.3. Scope of the Environmental Assessment

This EA describes and addresses the potential environmental effects of implementing the Proposed Action. In addition to the new fiber optic segments depicted in Figure 1-2, the CITS upgrade would include installing fiber optic cable in two other segments, the Lion's Head and the

Figure 1-1: Regional map of Vandenberg AFB and surrounding area.

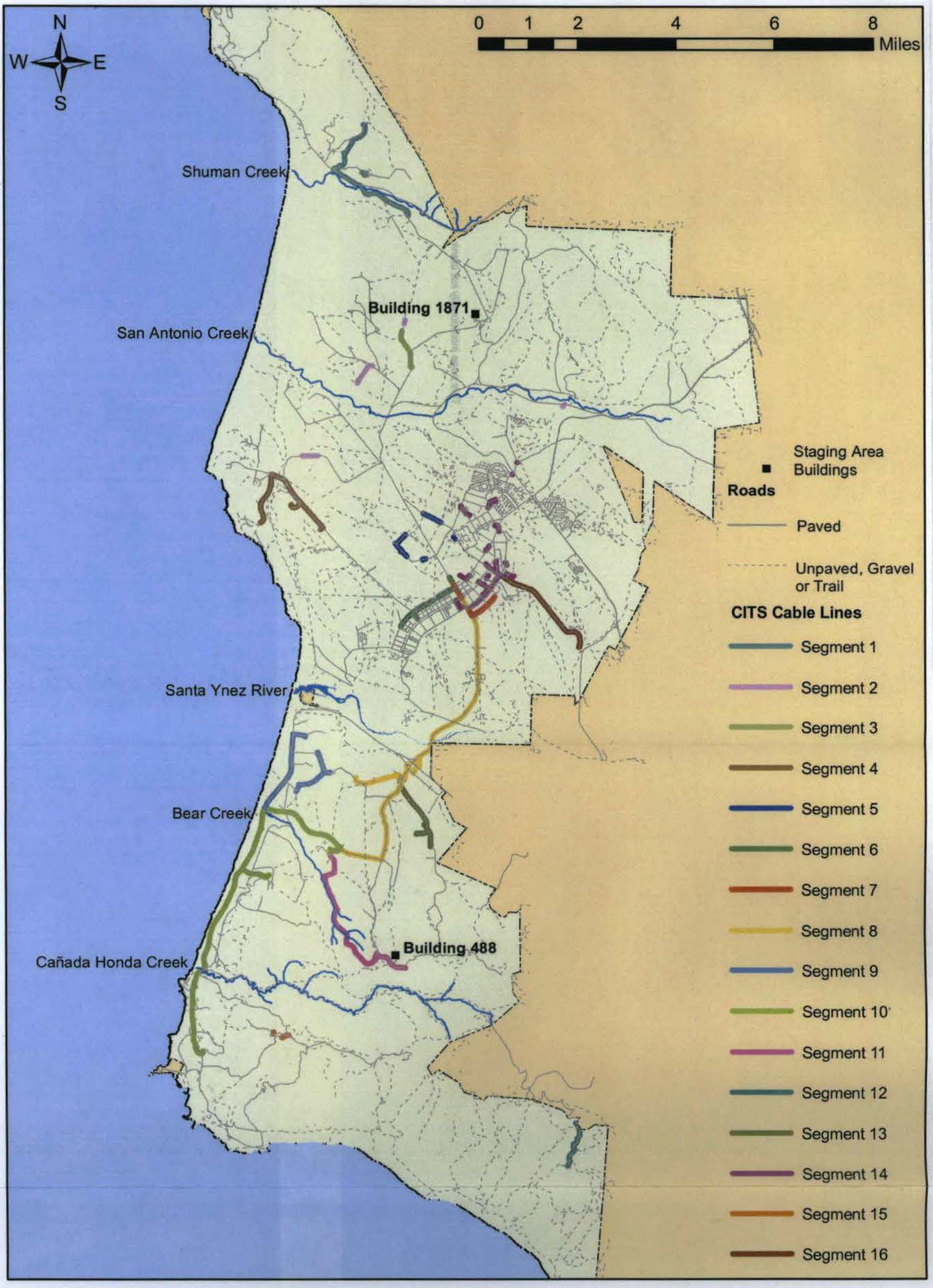

Figure 1-2: Proposed CITS fiber optic cable route segments.

Vandenberg Telemetry Relay Station (VTRS) segments. These segments were designed before the larger Information Transport System (ITS)/CITS infrastructure improvement was conceived. The potential effects of installing fiber optic cable, as well as manholes, handholes and pullboxes, along those two segments were previously addressed in the *Final Environmental Assessment for Installation of the Lion's Head Fiber-Optic Cable System, Vandenberg Air Force Base* (Tetra Tech 2000), and in the *Final Environmental Assessment for VTRS Fiber Optic Cable Installation on South Base, Vandenberg Air Force Base, California* (United States Air Force [USAF] 2004b). The current Lion's Head segment route was addressed within the Alternate 2 analysis in Tetra Tech 2000, which was the selected alternative for that EA. Both environmental assessments resulted in findings of no significant impacts. Once the larger CITS project was devised, the ITS engineers made a decision to wait and install the Lion's Head and VTRS segments as a part of the larger infrastructure installation. Given the previous analysis performed for those two segments in the abovementioned documents, installation along those segments is excluded from analysis in this EA, excepting for how they could potentially contribute to cumulative impacts (Section 4.8).

This EA also evaluates the potential environmental impacts of the No-Action Alternative. No other action alternatives were deemed feasible due to environmental and security constraints. Rough terrain and the presence of sensitive biological resources, and significant cultural resources preclude alternate routes; and security prohibits alignments that would extend outside of Air Force property or above the surface (i.e., aerial alignments would not be viable).

Consistent with CEQ regulations, the scope of analysis presented in this EA is defined by the potential range of environmental impacts resulting from the implementation of the Proposed Action and the No-Action Alternative. Resources potentially impacted are considered in more detail in order to determine whether additional analysis is required pursuant to 40 CFR Part 1501.4(c).

The resources analyzed in this EA include air quality, biological and cultural resources, hazardous materials and hazardous waste, human health and safety, transportation, and water resources.

Earth resources were considered but not analyzed in this EA because the methods selected for installing subsurface fiber optic cable are not anticipated to have negative effects on geology or soils. The CITS route would be installed at a maximum depth of 48 inches and remain primarily along paved roads, with portions of segments placed along unpaved or gravel roads, dirt access road and established trails. Tsunami or liquefaction hazards in project areas are not anticipated.

Per Executive Order (EO) 12898, *Environmental Justice*, the potential effects of the Proposed Action on minority communities and low-income communities were considered. However, because the Proposed Action would occur within Vandenberg AFB boundaries, the project would not affect low-income or minority populations within the region (Lompoc Valley and Santa Maria Valley).

Land use was considered but not analyzed in this EA because the Proposed Action would not change land use or affect land use planning at Vandenberg AFB. Additionally, there would be no conversion of prime agricultural land to other uses, and no decrease in its productivity. Finally, the Proposed Action would not conflict with environmental plans or goals, Air Force regulations, permit requirements, or existing uses of the project area or other properties.

While land use would not be affected, one aspect of land use, the management of the coastal zone, merits further discussion. Federal activity in, or affecting, a coastal zone requires preparation of a Coastal Zone Consistency Determination or a Negative Determination, in accordance with the federal Coastal Zone Management Act (CZMA) of 1972. The California Coastal Zone Management Program was formed through the California Coastal Act (CCA) of 1972. The Air Force is responsible for making final coastal zone consistency determinations for its activities within the state. The California Coastal Commission reviews federally authorized projects for consistency with the California Coastal Zone Management Program.

On Vandenberg AFB, the coastal zone extends inland from approximately 0.75 mile at the northern boundary to 4.5 miles at the southern end of the base. As depicted in Figure 1-3, portions of

Figure 1-3: Portions of CITS route that fall within the California Coastal Zone.

the proposed CITS fiber optic installation and upgrade are located within the Coastal Zone, thus they would be subject to consistency with the CZMA.

The CZMA and CCA mandate that the scenic and visual qualities of coastal areas be considered and protected as a resource of public importance. Some of the proposed fiber optic installation and upgrade under the Proposed Action are located within the California Coastal Zone. However, since activities associated with installation and upgrade of fiber optic would occur within already disturbed or developed areas, the scenic and visual qualities of coastal areas would not be affected. Therefore, no adverse impacts to the coastal zone, as defined by the CZMA and CCA, are anticipated.

Pollution prevention was considered but not analyzed in this EA because all efforts associated with the Proposed Action would be performed in accordance with Vandenberg AFB's Pollution Prevention Management Plan (PPMP). The small quantities of petroleum, oil and lubricants (POLs) used during cable line installation, primarily for maintenance of construction equipment, would be managed in accordance with PPMP guidelines as discussed under Hazardous Materials and Hazardous Waste Management.

Socioeconomics were considered, but are not analyzed, in this EA because the short-term nature (approximately 12 months) and the minimal manning (seven to eight workers at a time) associated with the Proposed Action would not affect socioeconomic conditions.

Solid waste was also considered, but not analyzed, in this EA because 1) the amount generated would be below levels sufficient to result in any adverse impacts, and 2) contractors would be required to appropriately dispose of all solid waste either at the Vandenberg AFB landfill as appropriate, or off of Vandenberg AFB property.

1.4. Applicable Regulatory Requirements

Federal and state regulatory requirements that would affect the implementation of the Proposed Action and No-Action Alternative are presented in Table 1.1 below.

A list of acronyms used in this EA can be found following the Table of Contents.

Table 1.1: Federal and state regulations applicable to the implementation of the Proposed Action.

Federal Regulation	Activity or Requirement
American Indian Religious Freedom Act (AIRFA) of 1978 (42 U.S.C. 1996)	The AIRFA states that the policies and procedures of federal agencies must comply with the constitutional clause prohibiting abridgment of religious freedom—including freedom of belief, expression, and exercise—for Native Americans. The AIRFA's policy is to consider Native American access to sites, use and possession of sacred objects, and freedom to worship, and directs federal agencies to revise policies and procedures to correct conflicts with Native American religious cultural rights and practices.
Archaeological and Historic Preservation Act (AHPA) of 1974 (16 U.S.C. 469a et seq.)	Directed toward the preservation of historic and archaeological data that would otherwise be lost as a result of federal construction or other federally-licensed or -assisted activities. The AHPA authorizes the Department of the Interior to undertake recovery, protection, and preservation of archaeological or historic data.
Archaeological Resources Protection Act (ARPA) of 1979 (U.S.C. 470aa-mm), Supplemental Regulations of 1984	The ARPA secures protection of archaeological resources and sites on public and Indian lands; requires permitting for any excavation or collection of archaeological material from these lands; provides civil and criminal penalties for violations.
Clean Air Act (CAA) of 1970 (42 U.S.C. 7401 et seq.)	Establishes that applicable state and national ambient air quality standards must be maintained during the operation of any emission source. National Ambient Air Quality Standards include primary and secondary standards for various pollutants. The primary standards are mandated by the CAA to protect public health, while the secondary standards are intended to protect the public welfare from adverse impacts of pollution, e.g., visibility impairment.

Table 1.1: Federal and state regulations applicable to the implementation of the Proposed Action.

Federal Regulation	Activity or Requirement
CAA Amendments of 1990	Establishes new federal non-attainment classifications, emissions control requirements, and compliance dates for areas in non-attainment. The requirements and compliance dates are based on the non-attainment classification.
Clean Water Act (CWA) of 1977 as amended (33 U.S.C. 1251 et. seq.)	Prohibits the discharge of pollutants from a point source into navigable waters of the United States, except in compliance with a National Pollutant Discharge Elimination System (NPDES) (40 CFR Part 122) permit. The navigable Waters of the United States are considered to encompass any body of water whose use, degradation, or destruction will affect interstate or foreign commerce. Section 401 of the CWA requires that the discharge of dredged or fill material into water of the United States does not violate State water quality standards. Generally, CWA Sec. 404 permits will not be issued until the State has been notified and the Applicant has obtained a certification of state water quality standards. Section 402 of the CWA requires that a NPDES certification be obtained from the applicable Regional Water Quality Control Board (RWQCB) for projects that would disturb one or more acres of land. Section 404 of the CWA establishes a program to regulate the discharge of dredged and fill material into waters of the United States, including wetlands. Activities in waters of the United States that are regulated under this program include fills for development, water resource projects (e.g., dams and levees), infrastructure development (e.g., highways and airports), and conversion of wetlands to uplands for farming and forestry.
Coastal Zone Management Act of 1972 (16 U.S.C. 1451-1464)	The CZMA plays a significant role in water quality management. Under the CZMA, a federal action that may affect the coastal zone must be carried out in a manner that is consistent with state coastal zone management programs.
Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531 et seq.)	Declares the intention of Congress to conserve threatened and endangered species and the ecosystems on which those species depend. The ESA requires federal agencies, in consultation with the United States Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries Service), to use their authorities in furtherance of its purposes by carrying out programs for the conservation of endangered or threatened species.
Section 7 of the ESA (16 U.S.C. 1536)	Contains provisions that require federal agencies to consult with the Secretary of Interior and take necessary actions to insure that actions authorized, funded, or carried out by them do not jeopardize the continued existence of endangered species and threatened species.
Migratory Bird Treaty Act (MBTA) of 1918 as amended (16 U.S.C. 703-712)	The MBTA implements various treaties and conventions between the United States (U.S.) and Canada, Japan, Mexico and the former Soviet Union for the protection of migratory birds. Under MBTA, the taking, killing, or possessing of migratory birds is unlawful.
National Environmental Policy Act of 1969 as amended (42 U.S.C. 4321-4347	Requires federal agencies to analyze the potential environmental impacts of major federal actions and alternatives and to use these analyses as a decision-making tool on whether and how to proceed.
National Historic Preservation Act (NHPA) of 1966 as amended (16 U.S.C. 470 et seq.)	The key federal law establishing the foundation and framework for historic preservation in the United States. The NHPA 1) authorizes the Secretary of the Interior to expand and maintain a National Register of Historic Places (National Register); 2) establishes an Advisory Council on Historic Preservation (Council) as an independent federal entity; 3) requires federal agencies to take into account the effects of their undertakings on historic properties, and to afford the Council an opportunity to comment upon any undertaking that may affect properties listed, or eligible for listing, in the National Register; and 4) makes the heads of all federal agencies responsible for the preservation of historic properties owned or controlled by them.
Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 (25 U.S.C. 3001-3013)	The NAGPRA restores certain rights to Native Americans with respect to the disposition of ancestral human remains and cultural objects; vests ownership of these materials (from federal or tribal lands) with designated Native American groups; requires notification of federal agency head when Native American cultural items are discovered on federal or tribal lands; prohibits trafficking in Native American human remains and cultural items; requires inventory and tribal notification of human remains and associated funerary objects held in existing collections by museums or federal agencies; provides for repatriation of these materials.

Table 1.1: Federal and state regulations applicable to the implementation of the Proposed Action.

Federal Regulation	Activity or Requirement
Pollution Prevention Act (PPA) of 1990 (42 U.S.C. 13101-13109)	This Act establishes that pollution should be prevented or reduced at the source whenever feasible; pollution that cannot be prevented should be recycled in an environmentally safe manner, whenever feasible; pollution that cannot be prevented or recycled should be treated in an environmentally safe manner whenever feasible; and that disposal or other release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner.
Resource Conservation and Recovery Act (RCRA) of 1976 (42 U.S.C. 6901 et seq.)	This Act gives the Environmental Protection Agency (EPA) the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous wastes.
Title II of the Toxic Substances Control Act (TSCA) of 1976 (15 U.S.C. 2601 et seq.)	The primary goal of TSCA is to control chemical hazards through the regulation of listed chemicals in commerce, including manufacture, import, processing, distribution, use, and disposal. TSCA has been amended with Title II to specifically address such substances as asbestos-containing materials.
State Regulation	**Activity or Requirement**
California Coastal Act of 1976	This Act provides long-term protection of California's 1,100-mile coastline for the benefit of current and future generations. Coastal Act policies constitute the standards used by the Coastal Commission in its coastal development permit decisions and for the review of local coastal programs prepared by local governments and submitted to the Commission for approval. These policies are also used by the Commission to review federal activities that affect the coastal zone.
California Clean Air Act of 1988	This Act develops and implements a program to attain the California Ambient Air Quality Standards for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter less than or equal to 10 microns in diameter, lead, sulfates, hydrogen sulfide, and vinyl chloride. 40 CFR Part 51 gives state and local agencies the authority to establish air quality rules and regulations. Rules adopted by the local air pollution control districts and accepted by the Air Resources Board are included in the State Implementation Plan. When approved by the U.S. EPA, these rules become federally enforceable.
Porter-Cologne Water Quality Control Act	Protects all waters of the state for the use and enjoyment of the people of California and declares that the protection of water resources be administered by the regional water quality control boards.

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2. Description of the Proposed Action and Alternatives

This chapter describes the Proposed Action and the No-Action Alternative for upgrading the CITS on Vandenberg AFB. Although alternatives to the Proposed Action - other than a No-Action Alternative - were considered during the development of the Proposed Action, these alternatives were rejected because the routes are located in areas where one or more of the following unfavorable conditions exist:

- The terrain is too rough to accommodate construction equipment.
- Impacts to significant cultural resources would be unavoidable.
- Impacts to sensitive biological resources could not be avoided through protection measures.
- The route would partially extend outside of the Vandenberg AFB property line and this would be an unacceptable security risk.
- The route would require aerial suspension of fiber optic cable and this would also be an unacceptable security risk.

2.1. Proposed Action

The Proposed Action consists of an infrastructure installation that would include 468,520 feet (ft) (or 89.7 miles) of new/replacement conduit/cable, along 259,520 feet (49.2 miles) of trenching, as well as installation of 82 new manholes, handholes, and pullboxes, and maintenance and upgrade work at 438 existing manholes, handholes, and pullboxes. Installation of new fiber optic infrastructure, and augmentation of existing fiber optic lines would occur over approximately a 12-month period.

Sixteen segments of the fiber optic cable route are depicted in the maps in this document (Figure 1-2 and Appendices A and B). This segmentation was done for purposes of describing the proposed CITS route and its potential effects on the biological and cultural environment (see Chapter 3). The CITS route would remain primarily along paved roads, with portions of segments placed along unpaved or gravel roads, dirt access roads and established trails. The line would also be installed in non-road (paved/unpaved/or trail) areas in two main areas, and in three smaller areas (Figure 2-1). The first main area would be in Segment 1 between Colt Road and Building 1959. The second main area would be in Segment 8 between Monroe Street and Mesa Road. Three additional small portions of the line (approximately 1,350 feet, 850 feet, and 275 feet) in Segment 8 would be installed near West Ocean Avenue and Arguello Road.

2.1.1. Installation Methods

The installation consists of the subsurface placement of 0.75-inch cables inside tubular conduits ranging in size from 1.25 inches to 4 inches in diameter. Conduits are constructed of either High-Density Polyethylene (HDPE) or Poly-Vinyl Chloride (PVC).

Methods for installing subsurface fiber optic cable depend upon topography and would include: trenching with a backhoe, trenching with a rock wheel, direct burial by plowing, and horizontal directional drilling (HDD).

All construction areas would be backfilled to grade and returned to like condition by replacing asphalt, concrete, landscaping, or earthen materials.

Soil stockpiled during excavation activities would be either used as backfill, used at another project if accepted by that project's contractor, used at the Vandenberg AFB landfill if the capacity for daily cover material is available, disposed of in an on-base borrow pit if approved by the 30th Civil Engineering Squadron (30 CES), or transported to an appropriate disposal facility off Vandenberg AFB.

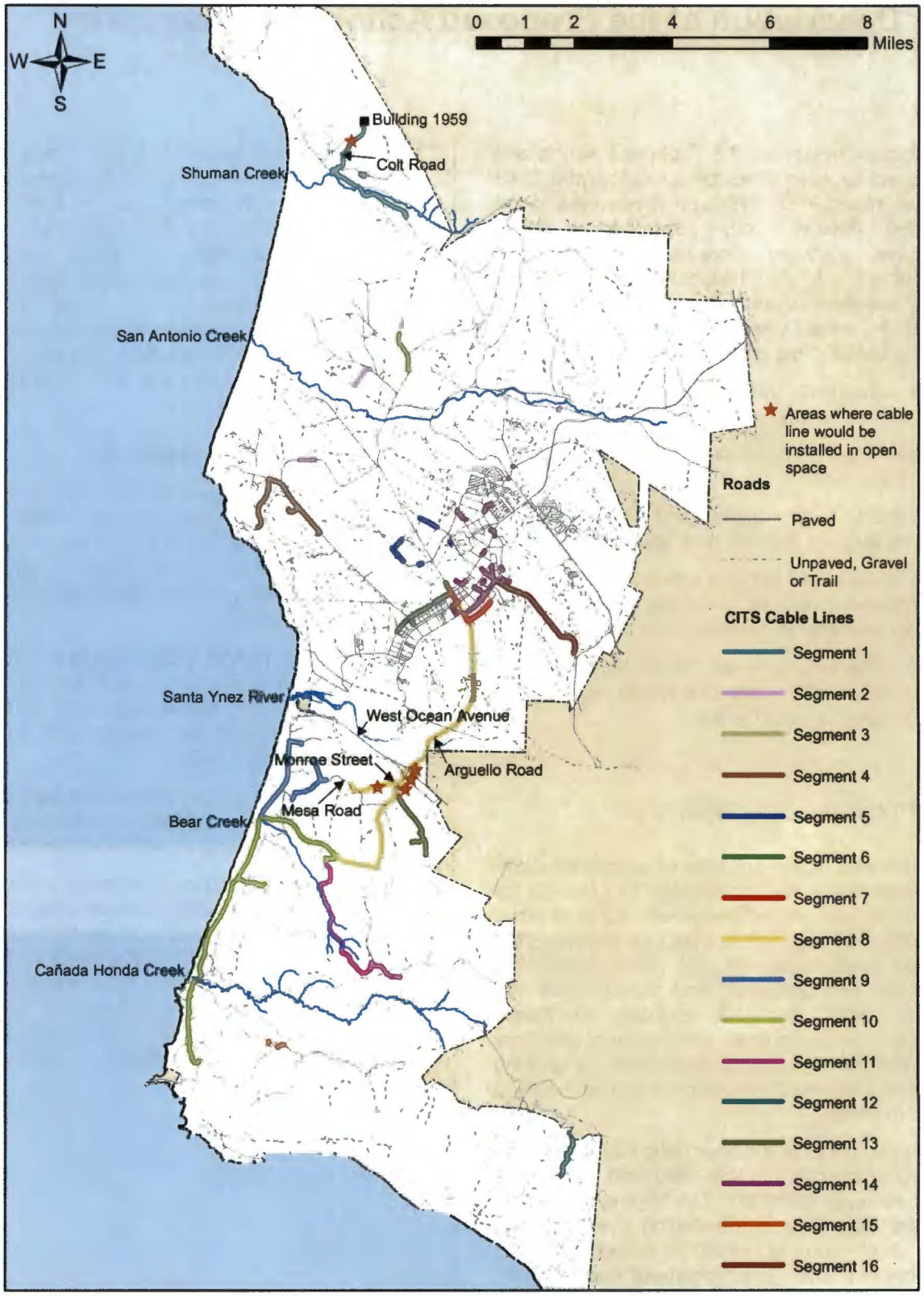

Figure 2-1: Areas where cable line would be installed in open space.

Plowed Conduit/Cable

Conduit is plowed into place when:

1) terrain is relatively even and free of rock outcroppings;

2) there is a wide road area in which to work; and

3) few underground utilities exist along the route.

Using a treaded, two-track vehicle, the conduit and subduct system is simultaneously plowed into the ground at an angle of 30 degrees vertical with respect to grade. The plow has an approximate overall width of eight feet, with each of the two tracks measuring approximately two feet in width. Soil is initially pushed aside during plowing, but falls back around the newly laid conduit. At a plow depth of 36 inches, the temporarily displaced soil spreads out to a width of approximately 12 inches (i.e., six inches on each side of the plowed area). The approximate overall width needed for this operation is 10 feet.

Trenched Conduit/Cable

Open trenching technology is used where underground utilities are present since the operation can be performed in a very specific area. Open trenching is also used along paved roads since the vehicle can travel along the road while the trench is excavated to the side of the road. Loosened soil is removed from and stockpiled next to the trench. Once the trench is excavated, a crew following a short distance behind the vehicle lays down the conduit into the trench by hand. A skip loader follows the crew to replace the excavated soil. If a large number of rocks are excavated, they are not returned to the trench; sand or select fill is used instead to complete the backfill. The total width of the construction zone would be approximately 30 feet.

At road crossings where directional boring is not feasible, and in sections of the route where installing under the road itself would minimize potential adverse effects, the open cut and restore method would be used. New duct installed under roadways in this manner would be encased in 900 pound per square inch (psi) concrete slurry. The asphalt or concrete surface would then be restored to like condition.

A rock wheel would be used in paved roads similar to those in which standard trenching would be used to avoid biological and cultural resources. A rock wheel cuts a trench and places and encases 1.25-inch rollpipe(s) in 900-psi concrete slurry.

Bored Conduit

HDD boring would be used where the proposed route encounters sensitive environmental areas (i.e., cultural resources and biological resources) through which trenching and plowing would have adverse effects. The Proposed Action would require boring operations at six sites (three cultural sites within Segment 4, and two cultural sites and one biological site within Segment 11) to protect cultural and biological resources.

The approximate work area required for boring would be 100 feet long by 50 feet wide at the bore entry and exit points. Bore lengths can extend up to 2,000 feet and would reach a maximum depth of no greater than 25 feet below grade. A surface-operated drilling device would be angled into the ground from the surface at the entry pit and directed to its destination using a radio-controlled mole that contains a cutter head. Personnel directing the mole control its depth and direction of excavation. A truck-mounted diesel generator would be used to power the equipment at the drill site. Once the bore head is drilled to destination location, the tunnel is reamed as required and HDPE rollpipe is placed. Fiber optic cable is then pulled or blown through the pipe.

During the typical boring process, bentonite fluid is pumped through the borehole to lubricate the drill bit, carry drill cuttings to the surface, and prevent the bore tunnel from collapsing. The boring fluid is typically stored in tanks at the drill site when not in use. After the bore is completed, any excess slurry remaining is removed from the site and either reused by the drilling contractor or disposed of at an appropriate facility.

Although it is not a common occurrence, fluid can escape the borehole through fissures or cracks in the soil and reach the ground surface. Every effort would be made to complete directional bores at depths so as to prevent bentonite releases. Containment measures included in the Storm Water Pollution Prevention Plan (SWPPP) would be implemented as needed, and a Frac-Out Contingency Plan would be implemented as needed to contain and manage any frac-out material.

2.1.2. Existing Conduit

All existing conduit planned for reuse was fully verified during preliminary project surveys. Existing conduit repairs are anticipated in one to two areas. Approximately 438 existing manholes, handholes and pullboxes would be accessed for

maintenance and upgrade work of existing conduit. Approximately 10 feet by 20 feet would be required at any one of the manholes to provide an adequate work area for inserting and pulling new cable and performing repair and maintenance activities. This would apply to all vehicular traffic around the manholes/handholds. An additional 10-foot wide track would be needed for vehicle access between roads and manholes/handholds that are off roadways to complete the required repair and maintenance.

2.1.3. Staging Areas

Staging areas for construction equipment and supplies would be established on pavement near Buildings 488 and 1871 (Figure 1-2). Prior to commencement of construction, the construction contractor would identify other proposed staging areas located in open fields along the route and obtain concurrence from the Natural Resources section, 30 CES/CEVPN, for the use of the proposed sites.

2.1.4. Construction Equipment

The type of construction equipment that would be used for implementing the Proposed Action is presented in Table 2.1. The exact type of equipment that would be used may vary slightly from these projections; however, these estimates provide a basis for analyzing related issues, such as air quality, noise, and traffic.

2.1.5. Construction Personnel and Schedule

Approximately seven to eight workers, at most, would be required for each construction method; blowing cable into existing conduit would require fewer workers. The construction period would last approximately 12 months, with 8-hour workdays and 5-day workweeks. The estimated completion date is 31 December 2007.

2.1.6. Protection Measures

In order to avoid or minimize potential adverse impacts to resources during construction activities associated with the Proposed Action, the resource protection measures outlined below would be implemented.

Air Quality

Although significant emissions would not occur from the Proposed Action, the following Santa Barbara County Air Pollution Control District (APCD) dust control measures would be implemented to further decrease fugitive dust emissions from ground disturbing activities:

- Apply water, preferably reclaimed, at least twice daily to dirt roads, graded areas, and dirt stockpiles to prevent excessive dust at the staging areas. Increase watering frequency whenever the wind speed exceeds 15 miles per hour. Chlorinated water would not be allowed to run into any waterway.
- Minimize vehicle speeds on exposed earth.
- Limit ground disturbance to the smallest, practical area and to the least amount of time.
- Designate personnel to monitor project activities to ensure that excessive dust is not generated.
- Comply with the SWPPP – including Best Management Practices (BMPs) to reduce dust emissions - and any existing federal guidelines and regulations to minimize or avoid adverse effects.
- If importation, exportation, and stockpiling of fill material are involved, soil stockpiled for more than two days shall be covered, kept moist, or treated with soil binders to prevent dust generation. Trucks transporting fill material to and from the site shall be tarped from the point of origin.

In addition to the above dust control measures, the following control measures would be implemented to decrease diesel emissions:

- When feasible, use equipment powered with federally mandated "clean" diesel engines.
- Minimize the size of the engine in equipment used for the project.
- Manage the use of equipment to minimize the number of pieces of equipment operating simultaneously and total operation time for the project.
- Maintain engines in tune per manufacturer or operator specification.
- Use California Air Resources Board (CARB)-certified low diesel fuel.
- If feasible, install Environmental Protection Agency (EPA) or CARB-certified diesel catalytic converters, diesel oxidation catalysts, and diesel particulate filters.

Table 2.1: Equipment list for CITS upgrade.

Equipment	Function	Make/Model	Size/Horsepower	Rubber Tire/Tracked	Gas/Diesel	Estimated # of Hours per Day *
Flat Bed Truck	Foreman's Truck	F-450 Crew Truck	1 Ton/325hp	Rubber Tired	Diesel	2
Flat Bed Truck	Work Truck	Sterling Flat Bed	2.5 Ton/330hp	Rubber Tired	Diesel	2
Dump Truck	Dump Truck	Internation 2647 Truck	10 Yard Dump/365hp	Rubber Tired	Diesel	6
Backhoe	Trenching	Extn Hoe	410e/90hp	Rubber Tired	Diesel	8
Backhoe	Trenching	Extn Hoe	310se/80hp	Rubber Tired	Diesel	4
Excavator	Trenching	Hoe	Tb175/60hp	Tracked	Diesel	8
Air Compressor	Trenching	I/R P185wjdr	185 Cmp/48hp	Rubber Tired	Diesel	1
Trencher	Trenching	Vermeer	T455/125hp	Tracked	Diesel	4
Vactron	Potholing	Vactron	800 Gal Vac	Rubber Tired	Diesel	1
Toe Cat	Plowing	Cat D7 Winch Cat	D7g/200hp	Tracked	Diesel	6
Cable Plow	Plowing	Cat D7 Plow	D7g/200hp	Tracked	Diesel	6
Dozer	Clean Up	John Deere	Jd 450/70hp	Tracked	Diesel	4
1 Ton Truck	Crew Truck	Ford Flatbed	7.3l	Rubber Tired	Diesel	1 -2
5 Yard Truck	Dump Truck	Ford	5.8 Cummins	Rubber Tired	Diesel	3 -4
Backhoe	Excavation	Case 580	3.9l	Rubber Tired	Diesel	5 - 6
Trencher/Saw	Trenching	Ditch Witch	6.8l	Rubber Tired	Diesel	5 - 6
Plow	Plow Cable					5 - 6
Dozer	Clean Up	John Deere 450	4.5l	Tracked	Diesel	4 - 5
Pick Up	Crew Truck	Ford Pick Up	F150 4.2l	Rubber Tired	Gas	1 - 2
Pump	Pump H20	Honda	4.5 Hp		Gas	0 - 1
Generator	Portable Power	Brigss & Stratton	8 Hp		Gas	0 -1
Blower	Mh Purging	Brigss & Stratton	3 Hp		Gas	0 -1
Wacker	Compaction	Wacker	3 Hp		Mix Gas	1 - 2
Air Compressor	Blowing Ducts	185	4.5l			1 - 2
Bore Machine	Boring	1720 Jetrac	17000 # Machine - 85 Hp		Diesel	3 - 4
Excavator	Mini Excavator	Mx272	25 Hp		Diesel	3 - 4
Vac	Vactor	Vacmaster T-800	12 Hp		Gas	1 - 2
Asphalt Roller	Paving	Bomag	BW90AD-2/16hp	Steel Drum	Diesel	3 - 4
Viber Plate	Paving	Wacker	VPG-165/5.5hp	Steel Plate	Gas	1 - 2
Cement Truck	Slurry/Concrete	Mack/CL700	472hp	Rubber Tired	Diesel	3 - 4
Water Truck					Diesel	3

* NOTE: Not all equipment will be used simultaneously or daily. Specific equipment is for specific tasks being performed. Estimates based on a 12-month project period, with 5-day workweeks, and 8-hour days.

▸ Follow CARB developed idling regulations for trucks during loading and unloading

▸ If feasible, replace diesel equipment with electrical equipment.

Biological Resources

Potential adverse impacts to biological resources would be avoided or minimized during construction activities associated with the Proposed Action through implementation of the following construction constraints and monitoring measures (see also Tables B -1 and B-2 of Appendix B).

Gaviota tarplant (Deinandra increscens ssp. *villosa)*

▸ A botanist familiar with Gaviota tarplant would survey all areas where this species was documented or is expected during the peak blooming period (June through September) and prior to any construction access to document and quantify its presence, and minimize adverse effects through protective measures such as flagging or rerouting.

▸ Where feasible, locations for proposed manholes, handholes, and pullboxes, would be determined in the field to avoid Gaviota tarplant and potential suitable habitat.

▸ In the open space between Monroe Street and Mesa Road (see Figure A-9 in Appendix A), cable would be installed after seed has set and before the rainy season.

- Biological monitors would verify when the area has gone to seed and the project contractor informed of the optimal period to work in the area.
- Plowing without vibration would be used.
- The cable would be laid from the top of the hill working down slope as quickly as possible to reduce soil disturbance.
- No scraping or clearing would occur to prevent any erosion.
- The proposed handhole in this site would be placed in an area with no Gaviota tarplant.
- Approximately two (2.0) acres of high quality Gaviota tarplant habitat is expected to be disturbed in this section. The area of disturbance would be minimized and no hydro-seeding would occur in this open space section.
- Removal of invasive plants after construction would occur in the area adjacent to the high quality Gaviota tarplant habitat. Removal of invasive plants would be on a 1:1 basis (i.e., two acres).

▸ The area of disturbance would be minimized. Pre- and post-construction surveys should quantify total habitat disturbance area.

Vernal pool fairy shrimp (Branchinecta lynchi)

▸ Vernal pools would be avoided by installing on roadways rather than shoulders of roads.

▸ For work within roadways that is adjacent to vernal pool fairy shrimp habitat or is directly upslope from vernal pool fairy shrimp habitat, silt fencing, or other appropriate BMPs to prevent siltation would be provided by and installed by 30 CES/CEVP prior to work within that area during rain events. Monitors would flag areas where silt fencing or BMPs would be installed. BMPs may include sand bags, straw bales or straw waddles.

▸ Qualified biologists would designate vernal pool fairy shrimp habitat to be avoided by flagging locations, and the area would be protected by placing construction fencing around pools where construction equipment and/or personnel would be present adjacent to or in the near vicinity of suitable vernal pool fairy shrimp habitat (i.e. Red Road, Tangair Road, and 13th Street).

▸ If feasible, construction equipment for access to the existing manholes at the corner of Tangair and Red Roads (Figure A-4); and south of New Mexico Avenue (Figure A-7) would be situated on the paved road and cable or lead line would be hand pulled. The following measures should further minimize adverse effects:

- No work would occur within vernal pool fairy shrimp habitat when water is present.
- Qualified biological monitors would be present during access and construction work within vernal pool fairy shrimp habitat.
- If monitors determine that construction fencing is required in these locations, monitors would flag the location and the area would be protected by placing construction fencing along the areas to be avoided.

▸ If hand-pulling of cable is not feasible at either of the two sites described above, it may be necessary to encroach within the perimeter of the

pool. In the event encroachment is necessary the following measures would be implemented:

- Construction equipment with pneumatic tires rather than tracked equipment would be used.
- Invasive non-native iceplant (*Carpobrotus* spp), existing within the Tangair/Red Roads pool, would be used as a truck-parking platform. Alternately, boards or plates would be used to distribute the weight of construction equipment for access.
- To offset impacts of encroachment into vernal pool fairy shrimp habitat, invasive non-native species, such as iceplant, would be removed from the pool to enhance viable vernal pool fairy shrimp habitat estimated at approximately 0.75 acres.

▸ Total habitat disturbances would be quantified through pre- and post-construction surveys.

Wetlands and riparian habitat

▸ Boring would be used to avert encroaching into the Bear Creek riparian corridor southeast of Space Launch Complex (SLC)-3.

▸ Entry and exit bore locations would be situated outside of Waters of the United States (U.S.) and riparian habitat.

▸ 30 CES/CEVPN would prepare a Frac-Out Contingency Plan in coordination with the construction contractor.

▸ BMPs and the Frac-Out Contingency Plan would be in place and implemented at any location where boring would occur near or beneath Waters of the U.S. The CITS construction crew would be responsible for the implementation of the Frac-Out Contingency Plan.

▸ The use of BMPs and implementation of the SWPPP would provide additional measures to protect water quality, such as the use of straw bales, straw waddles, and silt fencing.

Other Biological Resources Measures

▸ A qualified biologist would conduct pre-construction surveys at required sites during the avian breeding season (early March through August) to document the presence of any nesting native birds that are protected under the Migratory Bird Treaty Act (MBTA), and to recommend monitoring measures to minimize or avoid adverse effects.

▸ A qualified biologist would be present during construction activities in areas where sensitive resources are present to ensure implementation of measures to minimize or avoid adverse effects.

▸ A qualified biologist would be present during clearing of vegetation in open space at two locations in Segments 1 and 8 (see Figures A-1 and A-9). Any wildlife uncovered during these activities, excluding native bird species, would be moved to suitable habitat outside of the construction area.

▸ Removal of native vegetation and plant communities would be minimized to the greatest extent possible.

▸ To minimize the potential for wildlife entrapment, trenches and holes would not be left open overnight, whenever possible.

▸ Trenches or segments of trenches and holes that must be left open at the end of the workday would be ramped at a 45-degree angle or less to minimize the potential for entrapment of wildlife.

▸ A qualified biologist would inspect any trenches left open overnight before the start of construction and remove any trapped wildlife to suitable habitat outside of the construction area.

▸ In areas near streams, seeps, and wetlands, the contractor would implement appropriate erosion and silt control measures to minimize adverse impacts to these sensitive habitats.

▸ All soil excavated in areas adjacent to roads would be placed as close to the roads as possible.

A post-construction assessment would be conducted upon completion of the project by a qualified botanist to assess the need for revegetation at any of the sites. A report generated from this assessment would be submitted to the Vandenberg AFB Botanist.

▸ The construction contractor would provide the Vandenberg AFB Biologist and Botanist, and the biological monitors with a schedule of planned construction activities at least 48 hours in advance.

Cultural Resources

Table 2.2 summarizes the protection measures (by segment) recommended for cultural resources along the proposed fiber optic cable route. The Proposed Action would comply with Section 106 of the National Historic Preservation Act (NHPA) and with Air Force Instruction (AFI) 32-7065, *Cultural Resources Management*. In the event that previously undocumented cultural resources are discovered during construction activities, procedures established in 36 CFR 800.13 and the Vandenberg AFB Integrated Cultural Resources Management Plan would be followed.

Table 2.2: Methods of avoidance for segments with cultural resource concerns.

CITS Segment	Method of Avoidance
1	Mechanized trenching in roadbed gravels along centerline of Point Sal Rd., maximum depth of 12 to 18 inches below surface, not to exceed depth of road bed.
2	As El Rancho Oeste Rd. is built on approximately 6 feet of imported fill here, the site will not be impacted by CITS line. Trench on south side of Umbra Rd., no deeper than 12 to 18 inches below surface, not to exceed depth of road bed.
4	Bore under site with 60+ meter buffer around site boundaries; archaeological monitors at bore receiving pits.
9	Trench along centerline of Coast Rd. maximum depth of 12 to 18 inches below surface, not to exceed depth of road bed.
10	Trench along centerline of Bear Creek and Coast Rds., maximum depth of 12 to 18 inches below surface, not to exceed depth of road bed. Archaeological monitors required during trenching at some locations. At Cañada Honda Creek, an artificial dirt bridge was constructed over Cañada Honda Creek above the site. CITS cable would be installed in artificial dirt bridge and would not impact the site in any way.
11	Bore under site with 60+ meter buffer around site boundaries; archaeological monitor at bore receiving pits.
12	Trench along centerline of Station Rd., maximum depth of 12 to 18 inches below surface, not to exceed depth of road bed.
16	Trench in paved portions of Pine Canyon Road with excavation not to exceed depth of roadbed gravels for extent of site boundaries.

Hazardous Materials and Hazardous Waste

Strict compliance with all applicable regulations, including 30 SW Plan (30 SWP) 32-7086, *Hazardous Materials Management Plan*, would avert the potential for adverse impacts to the environment as a result of the presence and use of hazardous materials during the Proposed Action.

Strict compliance with all applicable regulations, including 30 SWP 32-7043A, *Hazardous Waste Management Plan*, would avert the potential for adverse impacts to the environment as a result of the potential generation of hazardous waste during the Proposed Action.

Implementing the measures presented below would further minimize the potential for adverse impacts for hazardous materials or hazardous waste.

- All hazardous materials would be properly identified and used in accordance with manufacturer's specifications to avoid accidental exposure to or release of hazardous materials required to operate and maintain construction equipment. Bentonite would be managed to minimize any fugitive dust emissions into the environment.

- All equipment would be properly maintained and free of leaks during operation. All necessary equipment maintenance and repairs would be performed in pre-designated controlled, paved areas to minimize risks from accidental spillage or release.

Because sections of the proposed route would be installed within boundaries of some Areas of Interest (AOIs), Areas of Concern (AOCs), and Installation Restoration Program (IRP) sites, there is the potential for encountering pollutants during implementation of the Proposed Action, as well as inadvertent interaction with IRP equipment and operations. To minimize risks to workers at specific sites, the following measures would be implemented in areas where sites would be encountered:

- Because of the number of monitoring wells present along the road shoulder of Coast Road, all activities associated with the Proposed Action would be strictly restricted to the roadway to avoid damage to equipment.

- To further avoid adverse effects, all activities associated with implementation of the Proposed Action would be coordinated with the 30 CES/CEVR (Installation Restoration) prior to implementation of the Proposed Action so as not to interfere with IRP actions, damage IRP equipment or monitoring wells, or expose workers to contamination.

Human Health and Safety

To provide for the health and safety of workers and visitors who may be exposed to the operations of the Proposed Action, the construction contractor would comply with federal OSHA requirements over the entire project. The contractor would also supply a health and safety plan to the base. Additionally, the contractor would coordinate with Explosive Ordnance Disposal Flight (EOD) prior to implementing the Proposed Action to ensure no adverse effects on human health and safety would occur from unexploded ordnance issues.

To minimize the potential adverse impacts from biological hazards (e.g., snakes and poison oak) and physical hazards (e.g., rocky and slippery surfaces), awareness training would be incorporated into the worker health and safety protocol.

Transportation

Potential adverse impacts to the transportation system would be avoided or minimized during construction activities associated with the Proposed Action through implementation of the following construction constraints and monitoring measures:

- The contractor would supply a traffic control plan that would cover all conditions to be encountered during construction, and which would be implemented to adequately facilitate the movement of traffic.

- Construction on mission-critical segments of road would be coordinated with the 30th Launch Group in order to ensure no mission impacts.

- Roadway users would be provided with adequate notice of when roadways would be under construction, so that users could plan for alternate routes when possible.

- All construction areas would be backfilled to grade and returned to like condition by replacing asphalt, concrete, landscaping, or earthen materials.

Water Resources

The Proposed Action would require a National Pollutant Discharge Elimination System (NPDES) General Permit because the total disturbed area would be greater than one acre (approximately 106 acres). In order to minimize potential impacts to water resources, the following measures would be implemented.

- The contractor would develop and implement a SWPPP to maintain compliance with the NPDES General Permit. The contractor's SWPPP would be approved by 30 CES/CEV prior to initiation of the Proposed Action.

- The contractor would implement all NPDES General Permit conditions, BMPs, and Discharge To Grade program procedures to minimize the potential for adverse impacts to local water resources.

- A Notice of Intent was coordinated with 30 CES/CEV prior to the submittal to the State Regional Water Control Board (SRWCB). A Notice of Termination would be submitted to the Central Coast Regional Water Quality Control Board (RWQCB) to ensure all permit termination requirements are met.

- Spill protection measures and a Frac-Out Contingency Plan, including placement of temporary berms and silt fencing, would be implemented to prevent contamination and to contain bentonite in the event of an accidental release into the environment.

- After completion of construction activities, disturbed soil would be treated by watering, revegetating, covering, or spreading soil binders.

- The contractor will comply with federal guidelines and regulations to address environmental compliance issues (including any Discharge To Grade program procedures and approvals by 30 CES/CEV), along with pollution prevention practices, to help provide the necessary protection measures to reduce impacts and ensure compliance with the NPDES General Permit.

In addition, in order to prevent impacts to groundwater in areas where it is known to occur at shallow depths (such as at IRP Sites 50 and 60), the following measures would be implemented.

- Fiber optic cable installation would be placed within the upper 12 to 18 inches of the ground.
- CITS installation at these sites would occur in the late summer/early fall when ground water levels are generally the lowest.

2.1.7. Additional Measures

While only minimal amounts of solid waste are expected to be generated from the Proposed Action, solid waste from the project would be minimized by following requirements contained in 30 SWP Plan 32-7042, *Solid Waste Management Plan*. Asphalt and concrete would be accepted at the Vandenberg AFB landfill if necessary and recycled when possible. Access to the landfill requires a Landfill Access Ticket (LAT), which would be coordinated through 30 CES/CEV Pollution Prevention Office.

Although the Proposed Action would not change land use at Vandenberg AFB, coordination with the California Coastal Commission is required for development within the coastal zone. As portions of the CITS route do fall within the California Coastal Zone, the Air Force is coordinating the Proposed Action with the California Coastal Commission in compliance with the Coastal Zone Management Act.

2.2. No-Action Alternative

The No-Action Alternative would consist of no upgrade to the CITS; therefore there would be no construction related to the installation of a fiber optic cable line. There would be no project-related environmental impacts resulting from new construction under this alternative. However, without the CITS upgrade, there would not be any increase in the speed and bandwidth of the CITS, and reliability would not be improved via dual connectivity. Additional facilities would remain unconnected to the system and therefore lack integrated high bandwidth networking options. Additionally, network maintenance issues would not be resolved. Finally, CITS is considered to be a part of the national defense system by the Air Force, and this system would not be operating at its full potential.

3. Affected Environment

Existing conditions of resource areas that have potential to be affected by the Proposed Action are described in this chapter and include air quality, biological and cultural resources, hazardous materials and hazardous waste management, human health and safety, transportation, and water resources. Other areas considered but not analyzed in this EA for reasons described in Section 1.3, *Scope of the Environmental Assessment*, include earth resources, environmental justice, land use, pollution prevention, socioeconomics, and solid waste.

3.1. Air Quality

Air quality is described based upon the concentration of pollutants in the atmosphere. These concentrations are expressed in units of parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$). The type and amount of pollutants emitted into the atmosphere, together with the size and topography of the air basin and the prevailing meteorological conditions, determine air quality. Comparing the concentration to state and federal ambient air quality standards determine the significance of any particular pollutant concentration. These standards represent the maximum allowable atmospheric concentrations that may occur while still providing protection for public health and safety with a reasonable margin of safety.

The Clean Air Act (CAA) required the U.S. EPA to establish ambient ceilings for certain criteria pollutants. Subsequently, the U.S. EPA promulgated regulations that set the National Ambient Air Quality Standards (NAAQS). NAAQS have been established for carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), particulate matter 10 microns or less in diameter (PM_{10}), particulate matter 2.5 microns or less in diameter ($PM_{2.5}$), and sulfur dioxide (SO_2). Of these criteria pollutants, only O_3 is a secondary pollutant – i.e., it is not directly emitted, but is formed from the reaction of nitrogen oxides (NO_X) and reactive organic compounds (ROCs). The NAAQS are presented in Table 3-1.

Under the California CAA, California established air quality standards for the state, known as the California Ambient Air Quality Standards (CAAQS). CAAQS are generally more stringent than the NAAQS and there are additional CAAQS for sulfates (SO_4), hydrogen sulfide (H_2S), vinyl chloride, and visibility-reducing particulate matter. The CAAQS are also presented in Table 3-1.

The area affected by the emissions from the Proposed Action includes Vandenberg AFB and the surrounding portions of northern Santa Barbara County. For CO, NO_2, PM_{10}, and SO_2, the affected area is generally limited to a few miles downwind of the emission source, while for O_3 it can extend many miles downwind. Because the reaction between ROCs and NO_X usually occurs several hours after they are emitted, the maximum O_3 level can be many miles from the source; therefore, the area affected by O_3 and its precursors produced by Vandenberg AFB, could include most of northern Santa Barbara County. In addition, O_3 and its precursors transported from other regions can combine with local emissions to produce high, local O_3 concentrations.

3.1.1. Regional Climate and Meteorology

The climate at Vandenberg AFB can be characterized as cool and wet from November through April and warm and dry from May through October. The average annual rainfall is approximately 14.7 inches, most of which falls between November and May (unpublished data, 30 SW). Winds are usually light during the nighttime hours, reaching moderate speeds of approximately 12 miles per hour by the afternoon. Winds are most often northwesterly on North Base and north to northeasterly on South Base. The strongest winds are associated with rainy season storms.

Table 3.1: Ambient air quality standards.

Pollutant	Averaging Time	CAAQS([1,3])	NAAQS([2,3])	
			Primary([4])	Secondary([5])
Ozone	8-hour	0.070 ppm[6] (137 µg/m^3)	0.08 ppm (157 µg/m^3)	same as primary
	1-hour	0.09 ppm (180 µg/m^3)	0.12 ppm[7] (235 µg/m^3)	
Carbon Monoxide	8-hour	9 ppm (10,000 µg/m^3)	9 ppm (10,000 µg/m^3)	--
	1-hour	20 ppm (23,000 µg/m^3)	35 ppm (40,000 µg/m^3)	--
Nitrogen Dioxide	annual average	--	0.053 ppm (100 µg/m^3) (arith mean)	same as primary
	1-hour	0.25 ppm (470 µg/m^3)	--	--
Sulfur Dioxide	annual average	--	0.03 ppm (80 µg/m^3)	--
	24-hour	0.04 ppm (105 µg/m^3)	0.14 ppm (365 µg/m^3)	--
	3-hour	--	--	0.5 ppm (1300 µg/m^3)
	1-hour	0.25 ppm (655 µg/m^3)	--	--
PM_{10}	annual mean (arith or geo)	20 µg/m^3 (geo mean)	50 µg/m^3 (arith mean)	same as primary
	24-hour	50 µg/m^3	150 µg/m^3	same as primary
$PM_{2.5}$	annual arith mean	12 µg/m^3	15 µg/m^3	same as primary
	24-hour	--	65 µg/m^3	same as primary
Sulfates	24-hour	25 µg/m^3	--	--
Lead	30-day average	1.5 µg/m^3	--	--
	quarterly	--	1.5 µg/m^3	same as primary
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m^3)	--	--
Vinyl Chloride	24-hour	0.010 ppm (26 µg/m^3)	--	--
Visibility Reducing Particles	1 observation (8 hours from 8 AM to 6 PM PST)	sufficient amount to produce extinction coefficient of 0.07 per kilometers due to particles when relative humidity <70%.	--	--

1. California Standards for ozone, carbon monoxide, sulfur dioxide (1- & 24-hour), nitrogen dioxide, PM_{10}, $PM_{2.5}$, and visibility reducing particles are not to be exceeded. Sulfate, lead, hydrogen sulfide, & vinyl chloride standards are not to be equaled or exceeded.
2. National Standards, (other than ozone, particulate matter, and those based upon annual averages or average arithmetic means) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight-hour concentration in a year, averaged over three-years, is equal to or less than the standard. For PM_{10}, the 24-hours standard is attained when 99% of the daily concentrations, averaged over three years, are equal to or less than the standard. For $PM_{2.5}$, the 24-hours standard is attained when 98% of the daily concentrations, averaged over three years, are equal to or less than the standard.
3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature and pressure of 25 ^{o} C and 760-mm Hg, respectively. Most measurements of air quality are to be corrected the reference temperature of 25 ^{o} C and reference pressure of 760-mm Hg; ppm in this table refers to ppm by volume or micromoles of pollutant per mole of gas.
4. National Primary Standards: The level of air quality necessary, with an adequate margin of safety to protect the public health.
5. National Secondary Standards: The level of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
6. Approved by the California Air Resources Board and is expected to become effective in late 2006.
7. Not applicable to Santa Barbara County effective June 15, 2005.

Vandenberg AFB is subject to early morning and afternoon temperature inversions about 96 and 87 percent of the time, respectively. In an inversion, air temperature rises with increasing altitude, which confines the surface air and prevents it from rising (USAF 2003). This restricts the vertical dispersion of pollutants and, therefore, increases local pollutant concentrations. Pollutants are "trapped" under an inversion layer until either solar radiation produces enough heat to lift the layer or strong surface winds disperse the pollutants. In general, these conditions occur most frequently during the nighttime and early morning hours.

3.1.2. Existing Air Quality

The U.S. EPA classifies air quality within each air quality control region with regard to its attainment of NAAQS. The CARB does the same for CAAQS. An area with air quality better than state or federal ambient air quality standards for a specific pollutant is designated as attainment for that pollutant. Any area not meeting those standards is classified as non-attainment. Santa Barbara County is in attainment or unclassified for all the ambient air quality standards except for the state standard for PM_{10} and the state O_3 standards. Currently, air quality in Santa Barbara County is classified as maintenance attainment for the federal one-hour O_3 standard (U.S. EPA 2003).

3.2. Biological Resources

This section provides a description of the biological resources present at and near the proposed CITS fiber optic network route. The scope of the survey includes vegetation and wildlife resources, as well as waters of the U.S. and wetlands. All route segments, depicted in the figures in Appendix A, and proposed and existing manholes, handholes, and pullboxes, were surveyed and/or surrounding habitat assessed for potential presence of special status plant and wildlife species.

Vandenberg AFB is located in a transitional ecological region that lies at the northern and southern distributional limits of many species, and contains diverse biological resources of considerable importance. The base provides habitat for many federal- and state-listed threatened, endangered, and special concern plant and animal species. Fourteen major habitat types have been described and mapped on the base (USAF 2003).

3.2.1. Methodology

A literature search, general biological survey, and special-status species survey were used to characterize the biological resources within the proposed project area. Existing vernal pool fairy shrimp protocol survey maps (SRS Technologies 2006 in progress) and Gaviota tarplant location maps were superimposed over CITS corridors, via GIS layers, and intersecting occupied habitat was documented and/or reviewed. Field surveys and habitat assessments for Segments 1 through 15 were completed in December 2005 and January 2006 and covered a corridor extending 60 feet on either side of the route. Field surveys for Segment 16, which was identified later, were completed in May 2006. Dominant plant species, special status plant species, and vegetation types were identified and documented. Sight, sound, tracks, or other signs determined presence of common and special status wildlife species. Special status wildlife species surveys were also completed in suitable habitats occurring along the proposed cable route.

Potential occurrence of plant and wildlife species, including special status species, undetected during field surveys was determined based on suitable habitat preferences and on known occurrence based on literature searches and other existing documentation. Sources used to determine potential occurrence include literature and maps of natural resources present at Vandenberg AFB (USAF 2003), California Natural Diversity Database (CNDDB); California Department of Fish and Game [CDFG] 1999, 2001, 2004a, 2004b) and existing local and regional references (Christopher 1996, 2002; Coulombe and Mahrdt 1976; Holmgren and Collins 1999; Keil and Holland 1998; Lehman 1994).

3.2.2. Plant Communities

The botanical surveys identified six distinct plant communities within the survey corridor – Ruderal, Non-native Grassland, Coastal Dune Scrub, Central Coastal Scrub, Arroyo Willow Riparian Forest, and Vernal Pools and Seasonal Wetlands.

Ruderal

Ruderal plant communities typically occur at roadsides, waste areas, and other sites

continuously disturbed by activities such as traffic, road construction, and road maintenance. Annual and usually non-native forbs and grasses that can rapidly invade disturbed areas dominate ruderal communities. Plant species commonly found at these sites include wild oats (*Avena* spp.), soft chess brome (*Bromus hordeaceus*), veldt grass (*Ehrharta calycina*), fescues (*Vulpia* spp.), black mustard (*Brassica nigra*), wild radish (*Raphanus sativus*), plantain (*Plantago erecta*), and coyote brush (*Baccharis pilularis*).

Non-native Grassland

These grasslands are characterized by a dense to sparse cover of annual grasses with flowering culms up to two feet high. Dominant plant species include bromes (*Bromus* spp.), veldt grass, wild oats, foxtail barley (*Hordeum murinum* spp. *leporinum*), ryegrass (*Lolium* spp.), fescues, redtop grass (*Agrostis stolonifera*), filarees (*Erodium* spp.), mustards (*Brassica* spp.), California burclover (*Medicago polymorpha*), California plantain, sweet fennel (*Foeniculum vulgare*), Italian thistle (*Carduus pycnocephalus*), poison hemlock (*Conium maculatum*), and iceplant (*Carpobrotus* spp.).

Coastal Dune Scrub

This diverse vegetation type occurs along the central coast of California, on sandy backdunes stabilized by vegetation cover, behind foredunes, and in transitional dune areas. Coastal dune scrub has relatively dense and continuous plant cover, composed of scattered shrubs, subshrubs, and herbs, dominated by goldenbush (*Ericameria ericoides*), California sagebrush (*Artemisia californica*), and bush lupine (*Lupinus chamissonis*). Also present are dune buckwheat (*Eriogonum parvifolium*), deerweed, California-aster (*Lessingia filaginifolia* var. *filaginifolia*). Important endemic plants in this community include San Luis Obispo monardella (*Monardella frutescens*), Blochman's leafy daisy (*Erigeron blochmaniae*), and black-flowered figwort (*Scrophularia atrata*). Coastal dune scrub occurs along most of the western coast of Vandenberg AFB.

Central Coastal Scrub

Coastal scrub is a diverse community that occupies a narrow corridor extending along almost the entire coast of California. Shallow-rooted, mesophyllic plant species that are often drought-deciduous and summer-dormant characterize this community. Common associates of this vegetation type include California sagebrush, coastal buckwheat (*Eriogonum parvifolium*), black sage (*Salvia mellifera*), silver dune lupine (*Lupinus chamissonis*), deerweed (*Lotus* spp.), and poison oak (*Toxicodendron diversilobum*). In disturbed or more mesic areas, the dominant species tends to be coyote brush.

Central Coast Arroyo Willow Riparian Forest

Central Coast Arroyo Willow Riparian Forest is a dense, low, closed-canopy, broad-leafed, winter-deciduous riparian forest dominated by arroyo willow (*Salix lasiolepis*), which can grow as a tree or treelike shrub.

Vernal Pools and Seasonal Wetlands

Vernal pools are ephemeral aquatic habitats supporting a plant community characterized by low growing, amphibious, herbaceous species. Germination occurs after winter rains fill the pool. Rising spring temperatures and drier weather cause the pool to evaporate. Plants such as docks (*Rumex* spp.) and rushes (*Juncus* spp.) characterize vernal pools.

3.2.3. Wildlife Species

Wildlife species commonly occurring along the segments of the proposed CITS route include species such as Pacific tree frog (*Hyla regilla*), western fence lizard (*Sceloporus occidentalis*), Southern alligator lizard (*Elgaria multicarinata*), racer (*Coluber constrictor*), turkey vulture (*Cathartes aura*), red-tailed hawk (*Buteo jamaicensis*), Western burrowing owl (*Athene cunicularia hypugea*) wrentit (*Chamaea fasciata*), loggerhead shrike (*Lanius ludovicianus*), song sparrow (*Melospiza melodia*), Western meadowlark (*Sturnella neglecta*), Botta's pocket gopher (*Thomomys bottae*), bobcat (*Felis rufus*), and coyote (*Canis latrans*).

3.2.4. Sensitive Plant Communities and Special Status Species

Table 3-2 summarizes the locations of sensitive plant communities and special status species throughout the proposed fiber optic cable route. Tables B-1 and B-2 in Appendix B list the locations and prevalence of these resources throughout the route and at manholes, handholes, and pullboxes.

Table 3.2: Occurrence and potential occurrence of sensitive plant communities and special status plant species along the proposed CITS fiber optic cable route.

Description	Status[1]	Segment Occurrence[2]		Comments
		O	P	
Vernal Pool		4, 6, 7, 8, 14, 16		
Deinandra increscens* ssp. *villosa Gaviota tarplant	FE/SE	1, 2, 4, 6, 7, 8, 11, 14, 16	3, 10, 13	Blooms May-Sep
Branchinecta lynchi Vernal pool fairy shrimp	FT	4, 6, 7, 8, 14, 16		
Athene cunicularia hypugea Western burrowing owl	BCC	8		Present in winter and during migration (Aug-May)
Lanius ludovicianus Loggerhead shrike	BCC		All segments	Present year-round. Breeds Mar-Aug

1 FE – Federal Endangered Species FT – Federal Threatened Species BCC – Federal Bird of Conservation Concern SE – California Endangered Species.
2 O = Documented occurrence P = Potential occurrence

Sensitive Communities and Special Status Plant Species

Vernal pools are sensitive plant communities occurring within the proposed CITS fiber optic route in Segments 4, 6, 7, 8, 14, and 16.

Gaviota tarplant (*Deinandra increscens* ssp. *villosa*), federally listed as endangered on March 20, 2000 (65 FR 14888-14898), was documented in habitats adjacent to Segments 1, 2, 4, 6, 7, 8, 11 14, and 16, and has the potential to also occur in Segments 3, 10, and 13. In addition, Gaviota tarplant was documented at a number of existing and proposed manholes, handholes, and pullboxes where access would be required for maintenance and upgrade work.

A member of the aster family, this tarplant is a yellow-flowered, gray-green, soft hairy annual that is three to nine decimeters (12 to 35 inches) tall with stems branching near the base. Gaviota tarplant was formerly known only from coastal terraces in the Gaviota area. However, over the last few years, seven new locations have been observed, including at least two populations on Vandenberg AFB: one near Point Arguello and one near Point Sal. This plant is most often associated with grasses, and on occasion, with coastal shrubs such as *Baccharis* and *Isocoma*.

Because this species appears very similar to other common species of tarplant, more populations are likely to be present on Vandenberg AFB and have been overlooked in the past. Vandenberg AFB is updating its inventory of populations of Gaviota tarplant by conducting surveys based on habitats and soils where existing populations are located. Surveys will be conducted over several growing seasons to assess approximate numbers of individuals in each population and to identify the climatic conditions (low/high precipitation) that most favor this species.

The U.S. Fish and Wildlife Service (USFWS) designated critical habitat for Gaviota tarplant on November 7, 2002. However, Vandenberg AFB was excluded from this designation under section 4(b)(2) of the Endangered Species Act. As a result, the proposed project is not in critical habitat.

Special Status Wildlife Species

Vernal pool fairy shrimp (*Branchinecta lynchi*), a federally threatened species, was documented in numerous vernal pools on Vandenberg AFB in 2005 through federal protocol presence/absence surveys (SRS Technologies 2006, report in progress). Vernal pools containing this fairy shrimp occur in Segments 4, 6, 7, 8, 14, and 16. The vernal pool fairy shrimp is a small crustacean that occupy a variety of vernal pool habitats, from small, clear, sandstone rock pools, to large, turbid, alkaline, grassland valley floor pools.

The USFWS designated critical habitat for vernal pool fairy shrimp on August 6, 2003 (68 FR

46684). Vernal pool fairy shrimp were not known to occur on Vandenberg AFB at that time.

Other special status species with the potential to occur within the proposed project corridor include California red-legged frog (*Rana aurora draytonii*) and Southwestern willow flycatcher (*Empidonax traillii extimus*).

California red-legged frog was considered in the vicinity of Bear Creek (Figure A-13). However, no red-legged frogs are known to occur at this site and the closest documented red-legged frog location is approximately 1.5 miles northwest of the Bear Creek CITS installation location. The Bear Creek riparian corridor would be avoided by boring prior to reaching the habitat; thus avoiding effects to water quality and downstream effects to red-legged frogs.

Southwestern willow flycatchers on Vandenberg AFB occur only in the riparian habitat of the Santa Ynez River near the 13th Street Bridge (Figure A-8). Because the cable installation would occur on the bridge and not disturb any habitat, this species would not be affected.

No other federal threatened or endangered wildlife species occur along the proposed CITS route. However, Western burrowing owls (*Athene cunicularia hypugea*), a federal bird of conservation concern, were documented during the surveys, and loggerhead shrikes (*Lanius ludovicianus*), also a federal bird of conservation concern, are likely to occur throughout the proposed route. Lastly, native avian species as well as their nests, eggs, and nestlings, are protected under the MBTA.

Western burrowing owls are year-round residents of open, dry grassland, desert habitats, and open scrub communities. This small owl can be active during the day and night. They usually nest in abandoned ground squirrel (or other small mammal) burrows, although they may dig their own burrows in soft soil. No nesting records have been documented on Vandenberg AFB in the last decade. Two burrowing owls were flushed during field surveys in Segment 8 near Mesa Road.

Loggerhead shrikes are common residents and winter visitors in lowlands and foothills throughout California. This bird prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches. It builds nests on stable branches of densely foliaged shrubs or trees. The breeding period extends from March through August. Loggerhead shrikes are likely to occur in all segments along the proposed CITS fiber optic cable route.

3.2.5. Waters of the United States and Wetlands

For the wetland hydrology criterion to be met, a site must be inundated or saturated or exhibit features that show the area was inundated or saturated for the required period of time (i.e., 45 days). A hydric soil is defined as "...a soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophilic vegetation (Environmental Laboratory 1987). No wetlands would be affected by the proposed project. One riparian/wetland area is present at the junction of the firebreak road and Bear Creek riparian corridor, southeast of SLC-3 (see Figure A-13). However, boring would be used as an installation method at this site to avoid encroaching into this sensitive habitat.

3.3. Cultural Resources

A summary of the prehistory and ethnohistory as it relates to the cultural setting is provided in Appendix C.

All portions of a 60-foot wide CITS fiber optic Area of Potential Effects (APE) were surveyed for cultural resources as part of previous undertakings. Many of the archaeological sites in the project area were identified during a three-year survey of Vandenberg AFB in the early 1970s (Spanne 1970). In 1998, SAIC and Chamber's Group (Carbone and Mason 1998) produced a basewide archaeological survey report identifying over 600 new cultural resources throughout Vandenberg AFB. Lastly, the most extensive archaeological investigations within the project area are associated with the Space Transportation System (STS) program and projects related to the STS program including a buried transmission line (Spanne 1974).

For purposes of evaluating the potential effects of the proposed project on cultural resources, the CITS route was divided into 16 segments (Figure 1-2 and Appendix A, Figure A-1 through A-18). Background investigations revealed 28 cultural resources within the 60-foot wide APE in seven of the segments, and one additional resource just outside the APE in an additional segment. Thirteen of these resources are known historic

properties while 16 remain unevaluated for the National Register of Historic Places (NRHP). Segments with cultural resources are further described below.

Segment 1 (Figure A-1)

Segment 1, at the northernmost end of the project area, follows El Rancho Road and Point Sal Road, turns east on Colt Road and continues on open space to Building 1959. This segment is approximately 3.5 miles long and bisects two archaeological sites, CA-SBA-722 and CA-SBA-2320, which are low density flaked stone deposits.

CA-SBA-722 is on the west side of Shuman Creek while CA-SBA-2320 is on the east side of the creek. Neither site has been evaluated for NRHP eligibility, but is assumed eligible for the purposes of the current undertaking.

According to 1992 engineering maps obtained from VAFB civil engineers, the depth of road base beneath El Rancho and Point Sal Roads is 36 inches. Trenching only 12 to 18 inches below surface, not to exceed the depth of the road bed at both sites would avoid impacting any archaeological deposits.

Existing or proposed manholes along this segment are not within or adjacent to cultural resources.

Segment 2 (Figure A-2)

Segment 2 consists of three short fiber optic lines totaling less than one mile, which would bisect two archaeological sites: CA-SBA-2238, a light flaked stone deposit situated in undulating sand dunes; and CA-SBA-3649, a low-density flaked stone deposit with trace marine shell fragments.

CA-SBA-2238, along the northernmost line of this segment on El Rancho Oeste Road, has not been evaluated for NRHP eligibility, but is assumed eligible for the purposes of the current undertaking. Since El Rancho Oeste Road was constructed on six feet of fill placed atop unstable dunes, the CITS fiber optic line would not reach native soil during trenching. Therefore, CA-SBA--2238 would not be affected during CITS installation.

The line along Umbra Road bisects CA-SBA-3649, formerly disturbed during construction of Umbra Road. CA-SBA-3649 has not been evaluated for NRHP eligibility, but is assumed eligible for the purposes of the current undertaking. The site would be avoided by trenching on the south side of Umbra Road at a maximum depth of 12 to 18 inches below surface, not to exceed the depth of the road bed for the extent of the site boundaries.

There are no isolated artifacts, existing manholes, or proposed manholes along this segment.

Segment 4 (Figure A-4)

Segment 4, approximately 3.0 miles long, extends along Tangair Road and turns west at Spur Road. The proposed fiber optic route would bisect three archaeological sites along Spur Road: CA-SBA-908, CA-SBA-2431, and CA-SBA-3376. Each site consists of a low-density flaked stone deposit on coastal sand dune surfaces. CA-SBA-2431 and CA-SBA-3376 also contain a trace amount of marine shell fragments.

None of the three sites have been evaluated for NRHP eligibility, but are assumed eligible for the purposes of the current undertaking. Avoidance measures would include boring underneath the sites and including a 60-meter buffer around the known site boundaries. In addition, archaeological monitors would be present during excavation of associated boring pits.

No isolated artifacts are recorded along this segment. Existing and proposed manholes are not within or adjacent to cultural resources.

Segment 9 (Figure A-10)

Segment 9 extends approximately 3.4 miles along a portion of coastal Vandenberg, south of the Santa Ynez River. The segment is comprised of an east and a west route. The west route runs along Coast Road from Bear Creak Road and turns east on Ordnance Road. The west route bisects two archaeological sites: CA-SBA-1128 and CA-SBA-2489.

CA-SBA-1128 is a specialized single component flaked stone tool production locale determined eligible for the NRHP in 1977. A deep road cut exists where Coast Road bisects the site. The CITS line would be installed down the centerline of Coast Road through the site at a maximum depth of 12 to 18 below surface, not to exceed the depth of the road base.

CA-SBA-2489 has not been evaluated for NRHP eligibility, but is assumed eligible for the purposes of the current undertaking. The site was recorded on the west side of Coast Road and consists of four Monterey chert flakes, all of which were identified in a disturbed matrix. Both a road cut and road fill exist along Coast Road where the

road bisects CA-SBA-2489. The CITS line would be installed down the centerline of Coast Road at a maximum depth of 12 to 18 below surface, not to exceed the depth of the road base.

A proposed manhole would be located immediately south of CA-SBA-2489 on the east side of the road in between the site and an isolated artifact. Excavation of the manhole would be monitored by archaeological monitors.

At the center of the east route, a cluster of isolates is near the APE and within proximity to a proposed manhole. As a precautionary method, archaeological monitors would be present during trenching at this location.

Segment 10 (Figures A-11 and A-12)

Segment 10 goes from SLC-3, west along Bear Creek Road, then turns south on Coast Road, continuing for several miles along Coast Road to SLC-6. Sixteen cultural resources are within the APE along the 9.0 miles of this segment.

Five archaeological sites are within the APE along Bear Creek Road (CA-SBA-549, CA-SBA-921, CA-SBA-2146, CA-SBA-2147, and CA-SBA-2154). Bear Creek Road was repaved in 2005 adding two inches to the former pavement and road base. In all, over 14 inches of road base and asphalt are present along the newly paved road. The CITS line would be installed along the centerline of Bear Creek and Coast Roads maintaining a maximum depth of 12 to 18 inches below surface, not to exceed the depth of the road where archaeological sites are present.

CA-SBA-549 is a large multicomponent prehistoric site approximately 600 feet from the coastline. The site is an aggregate of occupations as well as lithic procurement and resource processing loci. The oldest radiocarbon assay from the site dates to 9500 cal BP. The site was determined eligible to the NRHP in 1988.

CA-SBA-921 is a flaked stone procurement and food processing site. Buried utilities and Bear Creek Road destroyed one quarter of the site. The site has not been evaluated for NRHP eligibility, but is assumed eligible for the purposes of the current undertaking.

CA-SBA-2146 is a flaked stone and marine shell deposit recorded as a temporary camp. The site has not been evaluated for NRHP eligibility, but is assumed eligible for the purposes of the current undertaking. CA-SBA-2146 is heavily disturbed from construction of Bear Creek Road and Surf Road.

CA-SBA-2147 is a small campsite containing human remains on the north side of Bear Creek Road. The site has not been evaluated for NRHP eligibility, but is assumed eligible for the purposes of the current undertaking. CA-SBA-2147 is heavily disturbed from construction of Bear Creek Road. Given the presence of human remains at the site, archaeological monitors would be present during trenching activities at the site.

CA-SBA-2154 is recorded as a small food processing site containing flaked stone artifacts and manos. The site has not been evaluated for NRHP eligibility, but is assumed eligible for the purposes of the current undertaking. Construction of Bear Creek Road and installation of buried utilities along the road have affected the site.

Eleven cultural resources are within the APE along Coast Road (CA-SBA-534, CA-SBA-539, CA-SBA-551, CA-SBA-654, CA-SBA-670, CA-SBA-678, CA-SBA-1119, CA-SBA-1145/H, CA-SBA-1678, CA-SBA-2148, and the Juan Bautista de Anza National Historic Trail). Road base and asphalt along Coast Road comprise a minimum 18 inches of the road's surface. The CITS fiber optic line can avoid effects to historic properties by maintaining a maximum depth of 12 to 18 inches below the surface, not to exceed the depth of the road bed, within the archaeological site boundaries.

CA-SBA-534 is a moderate to dense lithic deposit containing flaked stone tools, debitage, and small amounts of bone and marine shell. It is bisected by Coast Road 200 feet above the beach on coastal bluffs overlooking the mouth of Bear Creek. The site has been tested on multiple occasions and was determined eligible to the NRHP in 1981.

CA-SBA-539 is on the southern rim of Honda Canyon, about 120 meters inland from the coastline. The site consists of a moderate midden deposit containing marine shell, lithics, shell beads, and human remains. The site has been substantially affected by infrastructure development and is bisected by Coast Road. Given the presence of human remains at the site, archaeological monitors would be present during trenching activities at the site.

CA-SBA-551 is a prehistoric archaeological site south of a large canyon on a broad slope extending from the east side of Coast Road northwest to the sea cliff. The site includes a

dense shell midden including marine shell, lithic debitage, mammal bone, fish bone, projectile points, mortar and pestle fragments, and beads. The site was determined eligible for the NRHP in 1978. Construction of Coast Road and two sets of railroad tracks have damaged the east side of the site.

CA-SBA-654 (immediately north of CA-SBA-551) is a prehistoric archaeological site determined eligible for the NRHP in 1978. The site contains a moderate to dense concentration of lithic artifacts including bifaces and biface fragments in various stages of production as well as vertebrate faunal remains and a low-density scatter of marine shell. The western edge of Coast Road and adjacent railroads cut below the depth of the cultural deposit in the northern portion of the site.

CA-SBA-670 is a prehistoric archaeological site on the northern rim of Honda Canyon, slightly inland from the coastline. Most of the site area is on a south-facing slope overlooking Honda Canyon, although a substantial midden deposit lies atop a knoll overlooking the Pacific Ocean. The site has been classified as a seasonal village or intermittently occupied habitation site with multiple chronological and material components. The site was determined eligible to the NRHP in 1979. Extensive damage has occurred at the site due to the construction of Coast Road, Surf Road, Honda Canyon Road, and numerous overhead and underground utilities including a waterline. Given the presence of human remains at the site, archaeological monitors would be present during trenching activities at the site.

CA-SBA-678 is a coastal prehistoric archaeological site consisting of a shell midden deposit. Boundaries of the site extend from the sea cliff east to Coast Road, with a portion continuing across to the east side of Coast Road. This site was determined eligible to the NRHP in 1980.

CA-SBA-1119, located in the bottom of Honda Canyon, is recorded as a low density deposit of marine shell and lithic debitage. The site was recently tested and is under evaluation for eligibility to the NRHP. The CITS line passes this site approximately 25 feet above the site's elevation on an artificial bridge that crosses Cañada Honda Creek. The CITS line would be installed within the bridge, and thus would not affect the site.

CA-SBA-1145/H contains both historical and prehistoric components and was determined eligible for the NRHP in 1978. The historic component of the site is associated with the Honda section house complex for the Southern Pacific Railroad. The complex was constructed between 1898 and 1900, and included a two-story foreman's house, bunkhouses for railroad workers, sheds, a cistern, and a coop for livestock. The prehistoric component consists of flake stone debitage in a disturbed stratigraphic context. Site integrity has been greatly compromised by construction and maintenance of Coast Road, a nitrogen plant and associated pipeline, an underground waterline, buried utility lines, and railroad tracks.

CA-SBA-1678 is a prehistoric site on a gentle west-facing slope toward the southern end of Segment 10. Low density archaeological materials (primarily flaked stone debris) are spread across a 24,450 square meter area. The site was determined eligible to the NRHP in 2004.

CA-SBA-2148 consists of flaked stone and ground stone artifacts as well as sparse marine shell fragments. The site was destroyed during the installation of the STS natural gas pipeline in the late 1980s. Prior to destruction, data recovery was employed as mitigation measure. The site was then determined ineligible to the NRHP due to a lack of integrity.

The Juan Bautista de Anza National Historic Trail was designated by Congress in 1990 based on mapping of the historic trail by numerous researchers. The portion of the Anza Trail that passes through Vandenberg AFB property is considered to be one of the more pristine remaining portions of the trail due to minimal coastal development. The CITS fiber optic line would not affect the Anza Trail since the cable would follow the previously disturbed Coast Road corridor.

Three proposed manholes are adjacent to or within cultural sites along Segment 10. A qualified archaeological monitor would be present during excavation of the proposed manholes.

Segment 11 (Figure A-13)

Segment 11 is approximately 4.5 miles long and extends along an unpaved dirt road from SLC-3 to Building 475 on Arguello Boulevard. Segment 11 bisects two archaeological sites: CA-SBA-945H and CA-SBA-2306.

CA-SBA-945H is the John Spanne Historic Ranch Site. The ranch once had at least two buildings present and has recorded historical archaeological

deposits consisting of household items and building materials. CA-SBA-2306 is a lithic procurement site with several hammerstones and manos. Neither site has been evaluated for NRHP eligibility, but are assumed eligible for the purposes of the current undertaking.

Avoidance measures for both sites would involve horizontal boring using a 60-meter buffer around the two sites. An archaeological monitor would be present during excavation of the borer entrance and exit pits. In addition, a proposed manhole is located within the boundary of CA-SBA-945H. The manhole location would be redirected either north or south of the site prior to construction.

Segment 12 (Figure A-14)

Segment 12 is at the southernmost end of the CITS project area and extends 1.1 miles along Station Road. The terrain along Station Road is mountainous and winding. One cultural resource is within the project APE, CA-SBA-2967.

Consisting of flaked stone debris, CA-SBA-2967 reaches into the APE along a steep, rocky slope. The site has not been evaluated for NRHP eligibility, but is assumed eligible for the purposes of the current undertaking. Segment 12 would be placed in road base following the centerline of Station Road for the extent of the site boundaries.

No isolated artifacts at existing or proposed manholes are along Segment 12.

Segment 16 (Figure A-18)

Segment 16 begins at the intersection of Iceland Avenue and Pine Canyon Road. It extends along Pine Canyon Road for approximately two miles before concluding at an installation gate. One cultural resource is just outside the project APE, CA-SBA-3092.

Consisting of surface low density lithic scatter with cores, CA-SBA-3092 is identified as a prehistoric chipping station location. The site has not been evaluated for NRHP eligibility, but is assumed eligible for the purposes of the current undertaking. Segment 16 would be placed in a fiber optic trench in the paved portion of Pine Canyon Road for the extent of the site boundaries. The trench would not be excavated beyond the depth of the roadbed gravel.

3.4. Hazardous Materials and Hazardous Waste Management

Hazardous materials and wastes are those substances defined as hazardous by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S.C 9601-9675), Toxic Substances Control Act (TSCA - 15 U.S.C. 2601-2671), the Solid Waste Disposal Act as amended by the Resources Conservation and Recovery Act (RCRA - 42 U.S.C. 6901-6992), and Title 22 of the California Code of Regulations (CCR). In addition, federal and state OSHA regulations govern protection of personnel in the workplace. In general, the definitions within these citations include substances that, because of their quantity, concentration, or physical, chemical, or infectious characteristics, may present substantial danger to public health (to workers), welfare, or the environment, when released into the environment.

3.4.1. Hazardous Material Management

Hazardous materials potentially used during fiber optic installation projects include POLs in equipment and vehicles. Additionally, bentonite fluid may be used during the boring process. Bentonite is used to lubricate the drill bit, carry drill cuttings to the surface, and prevent the bore tunnel from collapsing.

Vandenberg AFB uses approximately 5,000 hazardous materials items to accomplish mission and mission support activities, with the hazard potential of the materials ranging across the spectrum of toxicity. Organizations using hazardous materials on Vandenberg AFB must comply with California Business Plan requirements. Management of hazardous materials used on Vandenberg AFB follows procedures found in 30 SWP 32-7086, *Hazardous Materials Management Plan* (HMMP). The base operates using a Hazardous Materials Pharmacy (HazMart) concept, wherein the HazMart maintains inventories of hazardous materials, whether purchased by the Air Force or its contractors. Before releasing hazardous materials to the user, HazMart staff ensures a copy of the Material Safety Data Sheet is available and verifies that the material is suitable for use on Vandenberg AFB. By providing handling and use information, Vandenberg AFB controls the potential misuse of hazardous materials, maintains an accounting of the types of hazardous materials used on the base, and accomplishes use and

emissions reports as required by federal, state and local environmental regulations.

In addition to Vandenberg AFB requirements, contractors operating on Vandenberg AFB are subject to all federal, state and local hazardous materials regulations, and are subject to inspection by a variety of federal, state and local regulatory agencies.

3.4.2. Hazardous Waste Management

Management of hazardous waste at Vandenberg AFB complies with the RCRA Subtitle C (40 CFR Part 240-299) and with California Hazardous Waste Control Laws as administered by the California Environmental Protection Agency (Cal EPA) Department of Toxic Substances Control, under CCR Title 22, Division 4.5. These regulations require that hazardous wastes be handled, stored, transported, disposed of, or recycled according to defined procedures. The Vandenberg AFB *Hazardous Waste Management Plan* (HWMP; 30 SWP 32-7043A) outlines the procedures to be followed for hazardous waste management on Vandenberg AFB.

Contractors generating hazardous wastes in support of a government contract are required to follow federal, state and local laws and regulations, and use the Vandenberg AFB Generator ID Number to account for hazardous wastes generated. Because of the amount of hazardous waste generated per month under its Generator ID Number, Vandenberg AFB is classified as a large quantity, fully regulated generator, required to comply with all laws regulating the generation, storage, transportation, and disposal of hazardous waste. Vandenberg AFB employs a "cradle to grave" waste management approach. Generally, hazardous waste follows the 90-day accumulation rules as allowed by regulation, or is stored up to 270 days at authorized "satellite accumulation" points (SAPs). SAPs are located at the point of generation, and wastes may be stored until 55 gallons of hazardous waste, or one quart of extremely or acutely hazardous waste is accumulated. When the SAP limit is reached, the waste is transferred in a properly labeled Department of Transportation approved container from its point of origin to the Consolidated Collection Accumulation Point (CAP) at Building 6830, or to a permitted off-site treatment storage or disposal facility. Appendix 4 of the Vandenberg AFB HWMP provides detailed procedures for hazardous waste accumulation. Since the fiber optic installation contractor would use the Vandenberg AFB Generator Identification Number, the contractor must comply with the Base HWMP. A base contractor operates the Consolidated CAP for the Air Force and is responsible for receiving waste, inspecting waste containers for proper storage and labeling, and preparing Department of Defense (DOD) Form 1348-1A, issue/turn-in documentation, required to fund disposal of hazardous waste. Hazardous waste is then removed from Vandenberg AFB under hazardous waste manifest and shipped off-site for final disposal.

3.4.3. Installation Restoration Program

The federal IRP was implemented at DOD facilities to identify, characterize, and restore hazardous substance release sites. There are currently 136 IRP sites throughout Vandenberg AFB grouped into six Operable Units based on similarity of their characteristics. The IRP sites are remediated through the Federal Facilities Site Remediation Agreement (FFSRA), a working agreement between the USAF, the RWQCB – Central Region, and the Department of Toxic Substances Control. In addition to IRP sites, there are identified AOCs, where potential hazardous material releases are suspected; and AOIs, defined as areas with the potential for use and/or presence of a hazardous substance.

A number of AOCs, AOIs, and IRP sites occur along the proposed CITS route. Various contaminants could be present at these sites including TCE, polychlorinated biphenyl (PCB), volatile organic compounds (VOCs), total petroleum hydrocarbons (TPH), asbestos, and other hazardous contaminants. Activities associated with the installation of the fiber optic cable may encounter contaminated soils, or sites managed under the IRP program. Many of the AOIs have not yet been surveyed or are presently under investigation, thus actual extent and type of contamination is unknown at this time. Table 3.3 below provides a summary of the AOC, AOI and IRP sites and their current status. Appendix E depicts more detailed characteristics for these sites. The CITS cable line would also run though underground storage tank (UST) areas along California Avenue between 13th Street and Tangier Road that are not identified as an AOI, AOC, or IRP area.

Table 3.3: Relevant IRP sites and their current status.

Site	Location	Description	Status/Comments
AOI-139	Unpaved road along Bear Creek (Segment 11)	Abandoned oil well	• Site not surveyed. • CITS route passes within site boundary.
AOI-151	Arguello Rd and Monroe St (Segment 8)	USTs	• Site not surveyed. • CITS route passes within site boundary.
AOI-397	Airfield Rd (Segment 5)		• Site not surveyed. • CITS route passes within boundary.
AOI-420	Mod Rd (Segment 2)	Former fuel spill	• CITS route near a PCB-free transformer and 150 feet north of contamination source.
AOI-465	Ordnance Rd (Segment 9)	Septic tank and leach field	• Further investigation of leach field proposed. • CITS route passes within 75 feet of site.
AOI-351, AOI-580, AO-581	13th Street, New Mexico Ave, California Blvd (Segments 6, 7, 8)		• Sites not surveyed. • CITS route passes within boundaries of sites.
AOI-624, AOI-625, AOI-626,	13th Street, New Mexico Ave, California Blvd, Utah Ave (Segments 7, 14)	Oil sheds and grease racks	• Sites not surveyed. • CITS route passes within boundaries of sites.
AOC-013	Arguello Rd and Monroe St (Segment 8)	Elevated to IRP Site 60	• CITS route passes through site.
AOC-182-AOI-53, AOC-183-AOI-54, AOC-185-AOI-56	LF-08, LF-09, and LF-24 at Point Sal Rd (Segment 1).	Former Minuteman Silo	• Sites not investigated. • CITS route passes within site boundary.
AOC-192, AOC-198			• No contaminants found. • Sites pending closure, but not yet closed by regulators.
AOC-199-AOI-152	Arguello Rd and Monroe St (Segment 8)	Former fire station	• Site not investigated. • CITS route passes within site boundary.
AOC-208-AOI-275, AOC-209-AOI-278	13th Street (Segment 8)	Former GSA Motor Pool and Maintenance Shop	• Sites investigated but results not yet available. • CITS route passes within boundaries of sites.
AOC-214	Arguello Rd and Monroe St (Segment 8)	Former GSA Gas Station	• Site not investigated. • CITS route passes within site boundary.
IRP-003	Utah Ave (Segment 14)	USTs	• Pollutants: diesel • CITS passes through site.
IRP-005	SLC-3 (Segments 10 and 11)	Launch facility	• Pollutants: solvent, lube, oil, metals, RP-1, TCE • CITS passes through site.
IRP-006	SLC-3 (Segments 10 and 11)	Launch facility	• Pollutants: hydrazine, lube, oil, metals, solvents, IRFNA, RP-1, TCE • CITS passes through site.
IRP-009	Coast Rd, Kelp and Surf Roads (Segment 10)	SLC-4W	• Pollutants: TCE, contaminated waterline • CITS passes through treatment system.
IRP-041	Coast Rd and Skyview Rd (Segment 10)	Old power plant	• Pollutants: diesel. • CITS passes through site.
IRP-044	Airfield Rd (Segment 14)		• Site is closed, but not fully delineated • CITS passes through site.
IRP-045	Arguello Rd and Monroe St (Segments 8, 14)	Underground Storage Tanks	• Pollutants: POL. • CITS passes through site.
IRP-050	New Mexico Ave (Segment 7)		• Pollutants: TCE • CITS passes through site
IRP-060 (AOC-013)	Arguello Rd and Monroe St (Segment 8)	Old GSA Gas Station	• Pollutants: POL. • CITS passes through site.

3.5. Human Health and Safety

All construction activities and facility operations and maintenance on Vandenberg AFB are subject to the requirements of the federal OSHA regulations. Moreover, California OSHA (Cal OSHA) has jurisdiction over non-federal operations south of Honda Ridge Road on South Vandenberg AFB.

The affected environment for Health and Safety is the regulatory environment for health and safety issues established to minimize or eliminate potential risk to the general public and personnel involved in the installation of the CITS fiber optic network.

Relevant health and safety requirements include industrial hygiene and ground safety. Industrial hygiene is the joint responsibility of 30 SW/Safety Office (30 SW/SE), Bioenvironmental Engineering, and contractor safety departments. Responsibilities include monitoring of exposure to workplace chemicals and physical hazards, hearing and respiratory protection, medical monitoring of workers subject to chemical exposures, and oversight of all hazardous or potentially hazardous operations. Ground safety is the responsibility of 30 SW/SE and includes protection from hazardous situations and hazardous materials.

Hazardous materials, primarily POLs and bentonite, would be used for operating equipment and vehicles and boring processes under the Proposed Action. The potential exists for unexpected releases of these POLs and bentonite, which would generate hazardous waste. Therefore, the potential exists for persons participating in fiber optic installation and upgrade activities to become exposed to hazardous materials and hazardous waste. In addition, the following physical features have the potential to be present in the vicinity of the project area, and have the potential to adversely impact the health and safety of site workers:

- Physical hazards including traffic in the roads, holes and ditches, uneven terrain, sharp or protruding objects, slippery soils or mud, and unstable ground.
- Biological hazards such as animals (insects, spiders, and snakes), and disease vectors (ticks and rodents).

3.5.1. Unexploded Ordnance

Many areas on Vandenberg AFB were used as ordnance training ranges and have the potential to contain unexploded ordnance (UXO). Since ordnance can be found almost anywhere on base, the EOD must coordinate on all ground disturbing projects. According to EOD guidance, if ordnance is found on-site, it should not be disturbed. Workers in the vicinity must be alerted to the danger and directed away from it, and EOD must be contacted.

3.5.2. Noise

The Noise Control Act (NCA; 42 USC 4901 *et seq.*) sought to limit the exposure and disturbance that individuals and communities experience from noise. It focuses on surface transportation and construction sources, particularly near airport environments. The NCA also specifies that performance standards for transportation equipment be established with the assistance of the Department of Transportation. Section 7 of the NCA regulates sonic booms and gave the Federal Aviation Administration regulatory authority after consultation with the U.S. EPA. In addition, the 1987 Quiet Community amendment gave state and local authorities greater involvement in controlling noise.

Noise is often defined as unwanted sound that can interfere with normal activities or otherwise diminish the quality of the environment. Depending on the noise level, it has the potential to disrupt sleep, interfere with speech communication, or cause temporary or permanent changes in hearing sensitivity in humans and wildlife. Noise sources can be continuous (e.g., constant noise from traffic or air conditioning units) or transient (e.g., a jet overflight or an explosion) in nature. Noise sources also have a broad range of frequency content (pitch) and can be nondescript, such as noise from traffic or be specific and readily definable, such as a whistle or a horn. The way the acoustic environment is perceived by a receptor (animal or person) is dependent on the hearing capabilities of the receptor at the frequency of the noise, and their perception of the noise. (URS 1986)

The amplitude of sound is described in a unit called the decibel (dB). Because the human ear covers a broad range of encountered sound pressures, decibels are measured on a quasi-logarithmic scale. The dB scale simplifies this range of sound pressures to a scale of zero to

140dB and allows the measurement of sound to be more easily understood.

There are many methods for quantifying noise, depending on the potential impacts in question and on the type of noise. One useful noise measurement in determining the effects of noise is the one-hour average sound level, abbreviated L_{eq1H}. The L_{eq1H} can be thought of in terms of *equivalent* sound; that is, if a L_{eq1H} is 45.3dB, this is what would be measured if a sound measurement device were placed in a sound field of 45.3dB for one hour. The L_{eq1H} is usually A-weighted unless specified otherwise. A-weighting is a standard filter used in acoustics that approximates human hearing and in some cases is the most appropriate weighting filter when investigating the impacts of noise on wildlife as well as humans. Examples of A-weighted noise levels for various common noise sources are shown in Table 3.4.

Another useful acoustical metric for describing sound events is the A-weighted sound exposure level (SEL). The A-weighted SEL is the total sound energy in a sound event *if that event could be compressed into one (1) second.* In essence, SEL is an average sound level that is condensed into one-second. This provides a time-normalized metric and allows for analysis of events with different durations. As an example, an F-16 aircraft overflight (85% full power, altitude 210 feet, speed of 443 knots) was measured to have an A-weighted SEL of 113.1dB (Berry et al. 1991).

The "peak sound level" is the greatest instantaneous sound level reached during a sound event. Peak levels also have various frequency weightings applied to them. Peak levels, though useful in some cases, can often be misleading. It can occur that a single peak in a complex waveform can be substantially greater than the majority of a sound event. Therefore, peak levels should always be presented along with one or more of the metrics described above to better describe the sound event. An unweighted peak sound level is simply the peak sound level with no frequency weighting applied.

Existing noise levels on Vandenberg AFB are generally quite low due to the large areas of undeveloped landscape and relatively sparse noise sources. Background noise levels are primarily driven by wind noise; however, louder noise levels can be found near industrial facilities and transportation routes. Rocket launches and aircraft over flights create louder intermittent noise levels. On Vandenberg AFB, general ambient L_{eq1H} measurements have been found to range from around 35 to 60dB (Thorson et al. 2001). Most activities associated with the Proposed Action would generate relatively continuous noise.

Table 3.4: Comparative A-weighted sound levels.

Noise Level	Common Noise Levels	
(dBA)	Indoor	Outdoor
100 – 110	Rock band inside New York subway	Jet flyover at 304 meters
90 – 100	Food blender at one meter	Gas lawnmower at one meter
80 – 90	Garbage disposal at one meter	Diesel truck at 15 meters; noisy urban daytime
70 – 80	Shouting at one meter; vacuum cleaner at three meters	Gas lawnmower at 30 meters
60 – 70	Normal speech at one meter	Commercial area heavy traffic at 100 meters
50 – 60	Large business office; dishwasher next room	
40 – 50	Small theater or large conference room (background)	Quiet urban nighttime
30 - 40	Library (background)	Quiet suburban nighttime
20 - 30	Bedroom at night	Quiet rural nighttime
10 - 20	Broadcast and recording studio (background)	
0 – 10	Threshold of hearing	

3.6. Transportation

Vandenberg AFB is located approximately five miles west of the City of Lompoc. Two main highways connect Vandenberg AFB and metropolitan areas in the region (Figure 1-1). Highway 1, a north-south highway, traverses Vandenberg AFB and provides access to Santa Maria to the northeast, and Santa Barbara to the southeast when used in conjunction with Highway 101. State Route 246, an east-west highway, provides access to Lompoc to the east, and Santa Barbara to the southeast when used in conjunction with Highway 101. Vehicles enter Vandenberg AFB from these two roads through several gates.

On Vandenberg AFB, roads are categorized as highways, primary, collector, and local. Primary roads are the main circulation routes of the base. They are divided roads and support the heaviest traffic volumes. Collector roads are two lane roads that have lower speeds than primary roads. They receive traffic from the primary roads and act as distribution routes to local streets. Local streets are two-lane roads with the lowest speeds. They provide access between primary roads, collector streets, homes, and community facilities. (U.S. Air Force 2004a)

Existing roadway conditions are evaluated based on roadway capacity and traffic volume. The capacity, which reflects the ability of the network to serve the traffic demands of a roadway, depends on the roadway width, number of lanes, intersection control, and other physical factors.

A road's ability to accommodate different volumes of traffic is generally expressed in terms of Level of Service (LOS). The LOS scales ranges from A to F, with each level defined by a range of traffic volume to roadway capacity (V/C). LOS A, B, and C are considered good operating conditions with minor to tolerable delays experienced by motorists. LOS D represents below-average conditions. LOS E reflects a roadway at maximum capacity, and LOS F represents traffic congestion. All primary roads on Vandenberg AFB operate at a LOS between A and C (USAF 1994a). Local (secondary) roads operate at a LOS between A and B (USAF 1994b).

Given the minimal manning levels associated with the Proposed Action (seven to eight workers at a time and an average of one to three truck trips per day to deliver construction equipment and supplies), their entrance onto Vandenberg AFB and their use of the roads would be unlikely to affect existing off-base roadway conditions. Therefore, for the purposes of this EA, the affected environment, as it relates to transportation, would consist of those roadways on Vandenberg AFB on which construction would be performed during the installation of the fiber optic cable lines.

Only impacts to roadways designated as "primary roadways" will be analyzed. Construction on smaller, less used roadways would be unlikely to affect existing roadway conditions, given their good LOS ratings and lower traffic volumes. On North Base, the primary roads serve as the principle circulation routes into and through the cantonment area and include: California Boulevard, 13th Street, Utah Avenue, Nebraska Avenue and Washington Avenue (USAF 2004a). On South Base the primary roads are Arguello Road, Bear Creek Road and Coast Road (USAF 1994a). Of these primary roads on Vandenberg AFB, fiber optic cabling would be installed along all of them, excepting Nebraska Avenue.

3.7. Water Resources

The general storm water rainy season at Vandenberg AFB is from 1 October to 15 April. This timeframe has the greatest potential of construction site pollutant runoff. The average annual rainfall is approximately 14.7 inches (unpublished data, 30 SW).

3.7.1. Surface Water and Floodplains

The major freshwater resources of the Vandenberg AFB region include six streams, comprising two major and four minor drainages. The major drainages are San Antonio Creek and the Santa Ynez River. The minor drainages include Shuman, Bear, Cañada Honda, and Jalama Creeks. Aquifers capable of yielding large quantities of water usable for water supply are generally restricted to the deeper portions of the Santa Ynez River and San Antonio Creek (USAF 1998).

Watersheds are subject to on-base construction and agricultural runoff. San Antonio Creek, Santa Ynez River, and Shuman Creek also receive off-base agricultural runoff resulting in elevated dissolved solids, phosphates, and nitrates. Surface water is not directly used as a potable water supply at Vandenberg AFB. Ambient water quality sampling is performed by the Air Force.

The 100-year floodplain for the Santa Ynez River basin was defined by the Federal Emergency

Management Agency (FEMA). Segment 8 of the proposed CITS route crosses the 100-year floodplain.

3.7.2. Groundwater

Vandenberg AFB includes parts of two major groundwater basins, and at least two subbasins. Most of the northern third of the base is within the San Antonio Creek Basin, while most of the southern two-thirds of the base are within the Santa Ynez River Basin and associated Lompoc Terrace and Cañada Honda subbasins.

The main groundwater basin on the northern portion of Vandenberg AFB is the San Antonio Creek Basin. This basin coincides with the San Antonio Creek drainage basin. The San Antonio Creek Basin is approximately 25 miles long, extending from four miles east of the town of Los Alamos, west to the Pacific Ocean, and is a maximum of one mile wide. Water-bearing units in the San Antonio Creek Basin are comprised of unconsolidated clay, silt, sand, and gravel. These unconsolidated sediments are up to 4,000 feet thick and overlie consolidated Tertiary rocks, which are generally not water bearing.

Across the eastern two-thirds of the San Antonio Creek Basin, largely east of Vandenberg AFB, groundwater flows toward San Antonio Creek, and then west toward the Pacific Ocean. Approximately two miles west of the Vandenberg AFB boundary, a naturally occurring consolidated rock barrier causes the groundwater to rise to the surface where it forms the Barka Slough, and discharges to San Antonio Creek. Because of this nearly continual discharge of groundwater, San Antonio Creek west of Barka Slough runs year-round, whereas all other drainages in the valley are ephemeral (Muir 1964). West of Barka Slough, across San Antonio Terrace and Burton Mesa, the unconsolidated water-bearing units are only on the order of tens to a few hundred feet thick, comprised of dune sands, recent alluvium, and the Orcutt Sand. The flow direction in this area is controlled by bedrock topography, which is obscured by the overlying unconsolidated sediments, but is believed to mimic surface topography (Science Applications International Corporation [SAIC] 1990). Groundwater flow direction is therefore likely to be generally toward San Antonio Creek.

The Santa Ynez River Basin is approximately 70 miles long, and a maximum of 15 miles wide. It extends west from about half a mile east of the Santa Barbara County line to the coast. The Santa Ynez Mountains and Lompoc Terrace bound the basin to the south and the San Raphael Mountains, the lower Purisima Hills, and Burton Mesa bound it to the north. The Lompoc Plain represents the westernmost reach of the Santa Ynez River Basin. The most productive water-bearing zones of the entire Santa Ynez River Basin underlie this alluvial plain. Vandenberg AFB lies along the coast and traverses the westernmost three to four miles of the Lompoc Plain, where it is bounded to the south by the Lompoc Terrace and to the north by Burton Mesa (SAIC 1990). Groundwater in the Lompoc Plain area is divided into two main bodies: a shallow, unconfined body, and a deep, confined body. These two groundwater bodies are generally not hydrologically connected, but do appear to be connected in a few restricted areas. Where the comparison can be made, the hydraulic head of the shallow body is generally one to 10 feet higher than that of the deep body. Groundwater flow direction in the shallow body is irregular and poorly defined, and changes over time in response to seasonal changes (Upson and Thomasson 1951).

The most significant water-bearing zones on Vandenberg AFB, south of the Santa Ynez River Basin, are within the Lompoc Terrace subbasin. The drainage divide between Cañada Honda Creek and the Santa Ynez River bound this subbasin to the south, the Santa Ynez River to the north, the Pacific Ocean to the west, and the La Salle Canyon to the east. The water-bearing units of this subbasin have accumulated in a structural depression caused by faulting along its southern margin, and either faulting or folding along its northern margin (SAIC 1990). The basin is regarded as a subbasin because it is likely hydrologically connected with the Santa Ynez River Basin to the east, and possibly with the Pacific Ocean to the west (Evenson and Miller 1963). Groundwater in the Lompoc Terrace subbasin generally flows northeast to the Lompoc Plain or northwest to the ocean. Recharge to the subbasin is from infiltration of local precipitation, and from percolation of surface runoff (Evenson and Miller 1963). Immediately south of the Lompoc Terrace subbasin is the Cañada Honda subbasin. The subbasin is relatively small and is bounded to the north and south by the drainage divides to the Cañada Honda Creek.

Groundwater quality in the region meets all National Primary Drinking Water Regulation standards (USAF 1989). Continued overdraft of the groundwater basins could lead to degradation in the water table levels and a compaction of the

basins. A slight decrease in water quality has been occurring in the region due to the use of water for irrigation. As this water flows through the soil back to the basin, it entrains salts and leads to a buildup of salts in the groundwater (USAF 1989). Groundwater monitoring is conducted for basins that are used for drinking water. Water in the San Antonio Valley Creek groundwater basin exceeds drinking water standards for total dissolved solids, manganese, and iron. The Lompoc Terrace groundwater contains constituents that exceed maximum contaminant levels for total dissolved solids. Groundwater is used about one to three weeks per year, while maintenance is being performed on the state water line. However, groundwater is treated prior to its usage as potable water.

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4. Environmental Consequences

This chapter presents the results of the analysis of potential environmental effects of implementing the Proposed Action and the No-Action Alternative as described in Chapter 2.

4.1. Air Quality

The criteria for determining the significance of air quality impacts are based upon federal, state, and Santa Barbara County standards and regulations. Impacts would be considered to be significant if project emissions increase ambient pollutant concentrations from below the NAAQS or CAAQS to above these standards, or if they contribute measurably to an existing or projected ambient air quality standard violation.

In non-attainment or maintenance areas, federal agencies are required to prepare a conformity determination to prevent federal actions from causing an exceedance of a national ambient air quality standard. To reduce the time and resources federal agencies expend in preparing conformity determinations, EPA developed de minimis levels that serve as thresholds for focusing on those actions likely to have the most significant impacts. EPA deemed that emission levels below the de minimis levels were not significant.

As of June 15, 2005, Santa Barbara is in attainment of all federal air quality standards, and federal agencies are no longer required to prepare conformity determinations. However, Vandenberg AFB believes the threshold levels used in conformity determinations are still relevant for use as thresholds for determining if air quality impacts would be significant. The rationale used by EPA to develop the thresholds for nonattainment areas is no less applicable for areas in attainment. Although Vandenberg AFB is no longer required to observe the significance levels required in conformity determinations, their voluntary use of these levels for purposes of determining significance of air quality impacts in this EA provides a conservative approach to determining air quality impacts.

Maintenance areas have de minimis levels of 100 tons/year for NO_x. The VOC limits are 50 tons/year for areas inside an ozone transport region and 100 tons/year outside that region. Using a 365-day year, these de minimis levels equate to significance levels of 548 lbs/day of NO_x, and 274 or 548 lbs/day for VOCs for areas inside and outside of an ozone transport region, respectively. Vandenberg AFB will apply the 100 tons/year or 548 lbs/day VOC significance threshold. If Santa Barbara County becomes part of an Ozone Transport Region under the CAA, Vandenberg AFB will reassess its VOC significance threshold. These are the levels, 100 tons/year or 548 lbs/day of NOx, or VOC, Vandenberg AFB will use for determining whether or not air quality impacts are significant.

4.1.1. Proposed Action

Construction activities for the Proposed Action would occur over a 12-month period. Fugitive dust emissions generated from equipment operating on exposed ground and combustive emissions from the equipment would cause adverse air quality impacts. The largest adverse impacts would occur when vehicles disturb the soil on-site; smaller adverse impacts would result from combustive emissions.

The CITS contractor prepared an equipment list, which was used to prepare the detailed air emission inventory presented in Appendix D. The construction equipment list is presented in Appendix D, Table D-1, while the emission factors used to estimate the emission are found in Table D-2. For purposes of this analysis, it was estimated that an average of 0.48 acres per day would be disturbed. It was further estimated that on a reasonable worst-case day, 1.50 acres would be disturbed. With a disturbance of eight-hours per day, the reasonable worst-case day fugitive dust emissions would be 42 pounds of PM_{10} per day. These emissions would not be expected to cause an exceedance of any ambient air quality standard and therefore there would be no significant impacts from PM_{10}.

The methodology and assumptions used to calculate emissions from the Proposed Action are

presented in Appendix D. The daily and total emission from construction activities can be found in Tables D-3 and D-4, respectively. The daily emissions were estimated to be 181 pounds of CO, 133 pounds of NO_x, 47 pounds of PM_{10}, 20 pounds of ROC, and less than a quarter of a pound of SO_x. The project emissions were estimated to be 23.02 tons of CO, 16.85 tons of NO_x, 2.40 tons of PM_{10}, and 2.48 tons of ROC, and 0.03 tons SO_x. Emissions from the Proposed Action would not exceed the significance thresholds of 548 lbs/day or 100 tons/year. Therefore, no adverse impacts to the region's air quality would occur from the Proposed Action.

Before construction can begin for the Proposed Action, portable equipment powered by an internal combustion engine rated at 20 brake-horsepower or greater must be registered in the California State-Wide Portable Equipment Registration Program or have a valid Santa Barbara County APCD Permit to Operate.

Although significant emissions would not occur from the Proposed Action, the following Santa Barbara County APCD dust control measures would be implemented to further decrease fugitive dust emissions from ground disturbing activities:

- Water – preferably reclaimed – would be applied at least twice daily to dirt roads, graded areas, and dirt stockpiles to prevent excessive dust at the staging areas. Watering frequency would be increased whenever the wind speed exceeds 15 miles per hour. Chlorinated water would not be allowed to run into any waterway.
- Vehicle speeds would be minimized on exposed earth.
- Ground disturbance would be limited to the smallest, practical area and to the least amount of time.
- Personnel would be designated to monitor project activities to ensure that excessive dust is not generated at demolition sites.
- Compliance with the SWPPP – including BMPs to reduce dust emissions - and any federal guidelines and regulations to minimize or avoid adverse effects.
- If importation, exportation, and stockpiling of fill material are involved, soil stockpiled for more than two days would be covered, kept moist, or treated with soil binders to prevent dust generation. Trucks transporting fill material to and from the site would be tarped from the point of origin.

In addition to the above dust control measures, the following control measures would be implemented to decrease diesel emissions:

- When feasible, equipment powered with federally mandated "clean" diesel engines would be used.
- Engine size in equipment used for the project would be minimized.
- The use of equipment would be managed to minimize the number of pieces of equipment operating simultaneously and total operation time for the project.
- Engines would be maintained in tune per manufacturer or operator specification.
- CARB-certified low diesel fuel would be used.
- If feasible, EPA or CARB certified diesel catalytic converters, diesel oxidation catalysts, and diesel particulate filters would be installed.
- CARB-developed idling regulations for trucks during loading and unloading would be followed.
- If feasible, diesel equipment would be replaced with electrical equipment.

4.1.2. No-Action Alternative

Under the No-Action Alternative, the fiber optic infrastructure would not be upgraded and the emissions from the maintenance of the infrastructure would continue to occur. The air emissions from the No-Action Alternative would be same or less than the current emissions and, therefore, the air quality would remain the same or even improve if lower levels of maintenance were performed.

4.2. Biological Resources

Federal agencies are required by Section 7 of the Endangered Species Act of 1973, as amended (16 USC 1531 *et seq.*), to assess the effect of any project on federally listed threatened and endangered species. Under Section 7, consultation with the USFWS and the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries Service) is required for federal projects if such

actions could directly or indirectly affect listed species or destroy or adversely modify critical habitat.

It is also Air Force policy to consider listed and special status species recognized by state agencies when evaluating impacts of a project. Impacts to biological resources would occur if special status species (i.e., endangered, threatened, rare, or candidate) or their habitats, as designated by federal and state agencies, would be directly or indirectly affected by project-related activities. These impacts can be short- or long-term impacts, such as short-term impacts from noise and dust during construction, and long-term impacts from the loss of vegetation and, consequently, loss of habitat for wildlife.

Impacts to jurisdictional waters of the United States and wetlands are considered significant if the project would result in a net loss of wetland area or habitat value, either through direct or indirect impacts to wetland vegetation, loss of habitat for wildlife, degradation of water quality, or alterations in hydrological function.

4.2.1. Proposed Action

The Proposed Action would potentially result in disturbance to a 10-foot wide corridor on either side of the CITS route. In addition an area approximately 10 feet by 20 feet with a 10-foot wide access at each existing and proposed manhole, handhole, and pullbox, would be required to perform required maintenance and upgrades. All installation, maintenance and upgrade work would occur over a 12-month period. Throughout most of the route, the fiber optic cable would be installed along paved and unpaved roads to minimize adverse effects on biological and cultural resources. Directional boring would be used as necessary to minimize or avoid disturbance to sensitive biological resources and cultural sites. Where not located in previously disturbed or developed areas, disturbance to existing vegetation would occur.

Botanical Resources

Potential impacts to plant communities and plant species include:

- Short-term (temporary) and long-term (permanent) loss of habitat from construction related activities such as access, and excavation.
- Loss of individuals within the work area due to excavation, crushing or burial.
- Loss of individuals in habitats adjacent to work areas due to soil erosion.
- Soil erosion in wetlands or open water adjacent to the project site.

Installation of the proposed fiber optic cable would occur in open space at two main locations and three small locations (Figures 2-1, A-1, A-8, and A-9). The dominant plant community at the two main sites is non-native grassland. Within the non-native grassland in Segment 8 (Figure A-9), Gaviota tarplant is known to occur (see the Special Status Plant Species section below). The three smaller locations all occur near West Ocean Avenue and Arguello Road and are within a ruderal type community.

The remainder of the proposed fiber optic cable route would be installed along the ruderal community within the shoulders of roadways, except for the following four sections, where it would be installed on established paved and unpaved roadways:

- Segment 4 (Figure A-4) between Cross Road and Red Road installation would be on Tangair Road.
- Segment 8 (Figure A-8) between New Mexico Avenue and Terra Road installation would be on 13th Street.
- Segment 10 (Figures A-11 and A-12) between Bear Creek Road and SLC-6 installation would be on Coast Road.
- Segment 11 (Figure A-13) installation would be on unpaved firebreak and access roads between SLC-3 and Arguello Road.

One riparian/wetland area, identified in the proposed route in Segment 11, has the potential to be affected (Figure A-13). This area is located at the southwest corner of SLC-3 at the junction of the firebreak road and the unpaved access road. Directional boring would be implemented at this site to avoid adverse effects to the riparian/wetland habitat. A Frac-Out Contingency Plan would be prepared and implemented at this location to protect Bear Creek, the associated corridor and water quality.

Vernal pools within the proposed route occur along Tangair Road and along 13th Street (Figures A-4 and A-8), with one very small pool located at the corner of Pine Canyon Road and Iceland Avenue (Figures A-16 and A-18). The proposed

fiber optic cable would be installed on the roadways in these areas to avoid adverse effects to this sensitive habitat.

Two existing manholes are located within vernal pools: one near the intersection of Tangair and Red Roads (Figure A-4); and one south of New Mexico Avenue (Figure A-6). Access to these manholes would occur during the dry season. In addition, if feasible, the contractor would stage the construction equipment required at these manholes on the roadway (Red Road) or north of the railroad tracks (New Mexico Avenue), and hand-pull the cable. However, if this is not feasible, it may be necessary to encroach within the perimeter of the pool. This would be accomplished at Red Road by accessing the existing non-native iceplant and using it as a platform for the equipment. Boards or plates would be placed over the pool to distribute the weight of the equipment at New Mexico Avenue, and Red Road if further access is required. Approximately 0.75 acres of vernal pools and vernal pool fairy shrimp habitat would be affected.

Special Status Plant Species

Installation of the fiber optic cable through either trenching or plowing would result in the temporary short-term loss of all vegetation within an approximately 6 to 12-inch wide corridor. Any individuals of Gaviota tarplant present within that corridor would be permanently lost, and the seed bank within that corridor would be disturbed as a result of excavation, which could delay or prevent the reestablishment of plants. However, along road shoulders Gaviota tarplant occurs in the low quality habitat represented by the ruderal community, and is subject to continuous disturbance as a result of mowing and road maintenance. In addition, plants that occur within this ruderal habitat many times are isolated from high quality suitable habitat by the nature of their location.

Gaviota tarplant is present in the ruderal community along road shoulders throughout various segments of the proposed route and has the potential to occur in the ruderal community of additional segments (based on documented presence in the vicinity during prior surveys) and firebreaks. Gaviota tarplant also occurs in one area where the route would be located within a non-native grassland (see Figure A-9 in Appendix A). Lastly, Gaviota tarplant occurs or has the potential to occur at a number of the proposed and existing manholes, handholes, and pullboxes. Any Gaviota tarplant present within these areas would be subject to loss during installation of fiber optic cable or new handholes, or subject to disturbance as a result of vehicles driving over the plants for access to manholes, handholes, and pullboxes. If installation and access occurs after the plants have senesced and before germination (October through January), individual plants would not be lost. However, disturbances to the seed bank would still occur during installation of fiber optic cable and new handholes as a result of excavations.

The proposed project would result in the short-term temporary loss of non-native grassland and ruderal communities, both of which are suitable habitat for Gaviota tarplant. Approximately 53 acres of suitable Gaviota tarplant habitat would be affected by the proposed project. Acreage was estimated by adding the lengths of the entire CITS route where suitable habitat exists, and considering an average work corridor of 20 feet throughout the resulting total length. Actual acreage of Gaviota tarplant habitat would be determined through preconstruction surveys completed during the peak blooming period for the species (June through September) when Gaviota tarplant presence is confirmed. However, the majority of this affected habitat occurs along the ruderal community of road shoulders. This habitat, although suitable, is not considered high quality for the species given the continuous disturbance it experiences as a result of mowing and road maintenance performed for safety purposes. In addition, this ruderal habitat in many sections occurs in areas where there is no adjacent suitable habitat, thus individuals of the species that occur in these sectors are restricted to a long narrow corridor with no opportunity for expansion in the surrounding space. A portion of Segment 8 will potentially affect two acres of high quality Gaviota tarplant habitat. Minimization measures described in Section 2.1.6 and removal of two acres of invasive plants from adjacent suitable habitat should offset adverse effects to this habitat.

Measures to minimize or avoid adverse effects on this species range from avoidance to late season (October to December) construction, to monitoring during project implementation. Site-specific measures that should avoid significant adverse effects on this species are listed in Tables B-1 and B-2 of Appendix B. In addition, adherence to the construction constraints described in Section 2.1.6 should prevent potential adverse effects.

Wildlife Species

Installation of the proposed fiber optic cable would occur over twelve months, which would encompass the breeding season for wildlife species, including birds. The MBTA of 1918, as amended (16 U.S.C. 703-712), provides federal protection to native avian species, their nests, eggs, and unfledged young.

The potential impacts to wildlife species associated with the construction activities of the proposed action include:

- Short-term (temporary) and long-term (permanent) loss of habitat from construction related activities such as access, and excavation.
- Loss of individuals within the work area due to excavation, crushing or burial.
- Loss of individuals in habitats adjacent to work areas due to soil erosion.
- Abandonment of breeding and/or roosting sites due to project related noise and associated disturbance.
- Disruption of foraging or roosting activities due to project related noise and associated disturbance.
- Soil erosion into wetlands or open water adjacent to the project site.
- Degradation of water quality due to turbidity.

Wildlife, including mammals, amphibians, reptiles, and birds, present in the vicinity of construction could be affected by construction noise. Wildlife response to noise can be physiological or behavioral. Physiological responses can range from mild, such as an increase in heart rate, to more damaging effects on metabolism and hormone balance. Behavioral responses to man-made noise include attraction, tolerance, and aversion. Each has the potential for negative and positive effects, which vary among species and among individuals of a particular species due to temperament, sex, age, and prior experience with noise. Responses to noise are species-specific; therefore, it is not possible to make exact predictions about hearing thresholds of a particular species based on data from another species, even those with similar hearing patterns.

Herpetofauna

Reptile and amphibian hearing is poorly studied. However, reptiles and amphibians are sensitive to vibrations, which provide information about approaching predators and prey. Vibration and noise associated with construction activities could potentially cause disturbance to amphibians and reptiles. In addition, removal of vegetation would cause the loss of habitat for some species, which would have to seek alternate cover, adding to the disturbance.

These disturbances would be considered short-term and temporary and would not be considered of a magnitude to result in adverse impacts to populations within the vicinity of the project area.

Birds

Potential impacts to birds from construction and human generated noise, and habitat removal, include disruption to foraging, roosting, and breeding activities. Birds would be expected to move away from the area of disturbance during construction activities. However, once activity ceases, birds would be likely to return to the area.

The MBTA provides federal protection to native avian species, their nests, eggs, and unfledged young. Construction activities associated with the proposed project would result in short-term noise disturbances, which may temporarily disrupt foraging and roosting activities of individual birds. In addition, if the construction occurs during the breeding season for avian species, it has the potential to disrupt breeding activities including courtship, incubation and brooding.

Avian surveys immediately preceding the initiation of construction activities scheduled to occur between early March and late July would identify the presence of any nests. Monitoring during construction would identify any potential disturbance so measures could be implemented to avoid adverse effects.

Mammals

Potential project related impacts to mammalian species during construction activities include disruption of normal activities due to noise and ground disturbances. These impacts would be considered short-term and temporary and would not be considered of a magnitude to result in adverse impacts to populations within the vicinity of the project area.

Special Status Wildlife Species

Vernal pool fairy shrimp. The proposed project has the potential to result in short-term temporary

adverse effects to approximately 0.75 acres of vernal pool habitat, including: marginal to suitable habitat for vernal pool fairy shrimp (0.65 acre at Red Road; Figure A-3); and an area within high quality vernal pool complex habitat, although vernal pool fairy shrimp have not been documented in that exact location within the complex (0.1 acre south of New Mexico Avenue; Figure A-5). Every attempt would be made to avoid the habitat locations at Red Road and New Mexico Avenue, although unforeseen circumstances may exist that prevent complete avoidance there, or in other locations. However, potentially affected habitat that occurs along the Red Road shoulder, although suitable, is not considered high quality for the species given the location adjacent to the road, isolation from other habitat and presence of invasive non-native plant species. In addition, although the vernal pool complex south of New Mexico is of high quality, the manhole is located near the northern margin. Access would be limited temporally and in physical area (0.1 acres), and disturbance should be short-term.

Access to two manholes within vernal pool fairy shrimp habitat may result in the temporary short-term disturbance of the vernal pool fairy shrimp egg bank by displacement or burial, or the permanent loss of eggs through crushing by construction equipment or foot traffic. However, low quality habitat occurs along road shoulders due to the presence of iceplant in the vernal pool. In addition, vernal pools that occur within this vicinity are isolated from high quality suitable habitat by nature of their location.

Western burrowing owls, a federal bird of conservation concern, have the potential to occur at various sites during their non-breeding season (July through March). Activities associated with the proposed project have the potential to flush and temporarily disrupt roosting. However, these effects would be short-term and temporary in nature, and not be considered significant.

Loggerhead shrikes, a federal bird of conservation concern, are widespread on Vandenberg AFB. They have the potential to occur throughout all segments of the proposed route throughout the year. Disruption during the breeding season could result in adverse effects if birds were to abandon nests with eggs or chicks. Avian surveys immediately preceding the initiation of construction activities during the breeding season (early March through late July) in areas where suitable breeding habitat exists would identify the presence of any nests and provide an opportunity for implementing measures to minimize or avoid adverse impacts. Lacking the presence of active nests, activities associated with the proposed project could result in short-term temporary disturbances that would not be considered significant.

Site-specific measures that should avoid adverse effects on these species are listed in Tables B-1 and B-2 of Appendix B and are summarized in the constructions constraints and monitoring measures Section 2.1.6.

On April 20, 2006, the Air Force initiated formal Section 7 consultation under the ESA with the USFWS to address the potential adverse effects to Gaviota tarplant and vernal pool fairy shrimp. This formal consultation process was completed on July 20, 2006, with the issuance of a Biological Opinion (1-8-06-F-21). The Air Force will implement all terms and conditions of the Biological Opinion.

No other federally listed species were documented within any of the areas that would be affected by the proposed project.

4.2.2. No-Action Alternative

Under the No-Action Alternative, no construction would occur and, therefore, there would be no impacts to biological resources.

4.3. Cultural Resources

Cultural resources would be adversely affected if the Proposed Action would cause loss of the value or characteristics that qualify the resource for listing on the NRHP, or if the proposed project substantially alters the natural environment or access to it in such a way that traditional cultural or religious activities are restricted. The criteria used to evaluate the significance of cultural resources and to assess potential adverse project effects are set forth in the NHPA of 1966 (as amended). Associated implementing regulations include 36 CFR 60 and 800.

The following section discusses the consequences of the Proposed Action on cultural resources within the APE. Volumes 5 and 6 of the Vandenberg AFB *Integrated Cultural Resources Management Plan* specify archaeological monitoring during ground disturbing activities

within and near archaeological resources, regardless of the resource's eligibility for the NRHP.

4.3.1. Proposed Action

Cultural resources concerns are limited to eight segments of the route, identified as Segments 1, 2, 4, 9, 10, 11, 12 and 16 (Figures A-1, A-2, A-4, A-10, A-11, A-12, A-13, A-14 and A-18 in Appendix A). Table 4.1 summarizes the protection measures for cultural resources along the proposed fiber optic cable route by segment. Implementing these measures should avoid adverse effects to cultural resources.

The Proposed Action would comply with all relevant authorities governing cultural resources including Section 106 of the NHPA and with AFI 32-7065. In the event that previously undocumented cultural resources are discovered during construction activities, procedures established in 36 CFR 800.13 and the Vandenberg AFB Integrated Cultural Resources Management Plan would be followed.

In accordance with Section 106 of the NHPA of 1966 (36 CFR 800), the Air Force initiated consultation with the California State Historic Preservation Officer on 16 December 2005, requesting concurrence with a No Adverse Effect to historic properties. As of July 2006 no notification either agreeing with or objecting to the identification of historic properties within the project's Area of Potential Effects or the No Adverse Effect finding was received by the Air Force. Pursuant to 36 CFR 800.5(b)(1), the agency official may proceed after the close of the 30 day review period if the SHPO has not provided a response to the consultation.

Table 4.1. Cultural resources summary within or adjacent to CITS APE.

CITS Segment	Cultural Resource	NRHP Status	Resource Description	Method of Avoidance
1	CA-SBA-722	Unevaluated - assumed eligible	Low density flaked stone material located above Point Sal Rd, road cuts into the site.	Mechanized trenching in roadbed gravels along centerline of Point Sal Rd. – maximum depth of 12 to 18 inches below surface, not to exceed depth of road base.
1	CA-SBA-2320	Unevaluated - assumed eligible	Trace to low density flaked stone deposit; site was disturbed by construction of Point Sal Rd.	Mechanized trenching in roadbed gravels along centerline of Point Sal Rd. – maximum depth of 12 to 18 inches below surface, not to exceed depth of road base
2	CA-SBA-2238	Unevaluated - assumed eligible	Low density flaked stone scatter on east side of El Rancho Oeste Rd and railroad tracks.	As El Rancho Oeste Rd is built on approximately 6 feet of imported fill here, the site will not be impacted by CITS line.
2	CA-SBA-3649	Unevaluated - assumed eligible	Low density flaked stone debris with trace marine shell fragments; site was disturbed along southern boundary by construction of Umbra Rd.	Trench on south side of Umbra Rd, maximum depth of 12 to 18 inches below surface, not to exceed depth of road base
3	No cultural resources	n/a	n/a	n/a
4	CA-SBA-908	Unevaluated - assumed eligible	Variable density flaked stone deposits; portion of site destroyed by construction of Spur Road.	Bore under site with 60+ meter buffer around site boundaries; archaeological monitors at bore receiving pits.
4	CA-SBA-2431	Unevaluated - assumed eligible	Low density flaked stone deposits and trace marine shell.	Bore under site with 60+ meter buffer around site boundaries; archaeological monitors at bore receiving pits.
4	CA-SBA-3376	Unevaluated - assumed eligible	Low density flaked stone deposits and trace marine shell; materials in disturbed context.	Bore under site with 60+ meter buffer around site boundaries; archaeological monitors at bore receiving pits.

CITS Segment	Cultural Resource	NRHP Status	Resource Description	Method of Avoidance
5	No cultural resources	n/a	n/a	n/a
6	No cultural resources	n/a	n/a	n/a
7	No cultural resources	n/a	n/a	n/a
8	No cultural resources	n/a	n/a	n/a
9	CA-SBA-1128	Eligible – 1977	Specialized single component flaked stone tool production site; deeply cut when Coast Road was constructed and extensive disturbance was revealed during testing in 1974 and 2003.	Trench along center line of Coast Road to maximum depth of 12 to 18 inches below surface, not to exceed depth of road base
9	CA-SBA-2489	Unevaluated - assumed eligible	Sparse flaked stone deposit on west side of Coast Road; materials in disturbed stratigraphic context.	Trench along center line of Coast Road to maximum depth of 12 to 18 inches below surface, not to exceed depth of road base
10	CA-SBA-534	Eligible – 1981	Moderate to dense flaked stone debris with tools, faunal bone, and marine shell fragments; site is bisected by Bear Creek Road.	Trench along centerline of Bear Creek Road and Coast Road; maximum depth of 12 to 18 inches below surface, not to exceed depth of road base
10	CA-SBA-539	Eligible – 1977	Midden deposit containing marine shell, lithics, shell beads, and human remains; affected by infrastructure development, Coast Rd, Honda Ridge Rd, railroad, waterline, and underground utilities.	Trench along centerline of Coast Road; maximum depth of 12 to 18 inches below surface, not to exceed depth of road base; archaeological monitors required during trenching.
10	CA-SBA-549	Eligible – 1988	Large multicomponent site; food processing, lithic procurement; 9500 cal BP is earliest occupation.	Trench along centerline of Bear Creek Road; maximum depth of 12 to 18 inches below surface, not to exceed depth of road base
10	CA-SBA-551	Eligible – 1977	Dense shell midden including lithic debris, faunal bone, projectile points, mortars, pestles, and beads; impacted by Coast Road and railroad tracks.	Trench along centerline of Coast Road; maximum depth of 12 to 18 inches below surface, not to exceed depth of road base
10	CA-SBA-654	Eligible – 1978	Moderate to dense concentration of lithic debitage and various stage bifaces, faunal remains and low density marine shell fragments.	Trench along centerline of Coast Road; maximum depth of 12 to 18 inches below surface, not to exceed depth of road base
10	CA-SBA-670	Eligible – 1979	Classified as a seasonal village site w/multiple chronological and material components; human remains present; extensive site damage due to Coast, Surf, and Honda Canyon Road, buried utilities, and a buried waterline.	Trench along centerline of Coast Road; maximum depth of 12 to 18 inches below surface, not to exceed depth of road base; archaeological monitors required during trenching.
10	CA-SBA-678	Eligible – 1980	Low to moderate density midden deposit; impacted by construction of Coast Road.	Trench along centerline of Coast Road; maximum depth of 12 to 18 inches below surface, not to exceed depth of road base.
10	CA-SBA-921	Unevaluated - assumed eligible	Flaked stone procurement and food processing site; one quarter of the site was destroyed by buried utilities and Bear Creek Rd.	Trench along centerline of Bear Creek Road; maximum depth of 12 to 18 inches below surface, not to exceed depth of road base.

CITS Segment	Cultural Resource	NRHP Status	Resource Description	Method of Avoidance
10	CA-SBA-1119	Unevaluated - assumed eligible	The site is located within low lying terraces of Cañada Honda Creek.	An artificial dirt bridge was constructed over Cañada Honda Creek above the site. CITS cable will be installed in artificial dirt bridge and will not impact the site in any way.
10	CA-SBA-1145/H	Eligible – 1978	Site of the historic Honda section house complex w/prehistoric components (flaked stone debris); heavily impacted along Coast Road from road construction, railroad, and numerous buried utilities.	Trench along centerline of Coast Road; maximum depth of 12 to 18 inches below surface, not to exceed depth of road base.
10	CA-SBA-1678	Eligible – 2004	Low density flaked stone debris and sparse groundstone (manos); impacted by construction of Coast Road and outbuildings of Space Launch Facility 6.	Trench along centerline of Coast Road; maximum depth of 12 to 18 inches below surface, not to exceed depth of road base.
10	CA-SBA-2146	Eligible – 1988	Flaked stone and marine shell deposit; heavily disturbed from construction of Bear Creek and Surf Roads.	Trench along centerline of Bear Creek Road; maximum depth of 12 to 18 inches below surface, not to exceed depth of road base.
10	CA-SBA-2147	Unevaluated - assumed eligible	Small flaked stone reduction located with human remains; impacted by construction of Bear Creek Road.	Trench along centerline of Bear Creek Road; maximum depth of 12 to 18 inches below surface, not to exceed depth of road base; archaeological monitors required during trenching.
10	CA-SBA-2148	Ineligible – 1988	Flaked stone debris, groundstone artifacts, and sparse marine shell fragments; site was destroyed during installation of STS natural gas line.	No impact from CITS
10	CA-SBA-2154	Unevaluated - assumed eligible	Small food processing site with flaked stone debris and manos; disturbed by construction of Bear Creek Rd and buried utilities.	Trench along centerline of Bear Creek Road; maximum depth of 12 to 18 inches below surface, not to exceed depth of road base.
10	Anza Trail	Ineligible – 1994	The Juan Bautista de Anza Historic Trail was designated by Congress in 1990; extends along portions of VAFB coast.	No impact from CITS
11	CA-SBA-945H	Unevaluated - assumed eligible	The John Spanne Historic Ranch Site; at least two non-extent buildings; sparse deposits of building materials and household items; bisected by unpaved road.	Bore under site with 60+ meter buffer around site boundaries; archaeological monitor at bore receiving pits.
11	CA-SBA-2306	Unevaluated - assumed eligible	Flaked stone procurement site w/multiple hammerstones; manos present; situated on steep slope above creek; bisected by unpaved road.	Bore under site with 60+ meter buffer around site boundaries; archaeological monitors at bore receiving pits.
12	CA-SBA-2967	Unevaluated - assumed eligible	Flaked stone debris on steep rocky slope; portion of site is bisected by Station Road.	Trench along centerline of Station Road; maximum depth of 12 to 18 inches below surface, not to exceed depth of road base.
13	No cultural resources	n/a	n/a	n/a
14	No cultural resources	n/a	n/a	n/a
15	No cultural resources	n/a	n/a	n/a

CITS Segment	Cultural Resource	NRHP Status	Resource Description	Method of Avoidance
16	CA-SBA-3092	Unevaluated - assumed eligible	Surface low density lithic scatter with cores; prehistoric chipping station	Trench in paved portions of Pine Canyon Road with excavation not to exceed depth of roadbed gravels for extent of site boundaries.

4.3.2 No-Action Alternative

Under the No-Action Alternative, the proposed fiber optic network would not be installed and, therefore, no impacts to cultural resources would occur. Maintenance activities associated with this existing transmission system could possibly generate adverse impacts to cultural resources if digging or trenching were to occur; however, adverse impacts would be unlikely.

4.4. Hazardous Materials and Hazardous Wastes

Potential impacts as a result of hazardous materials and hazardous waste are evaluated using federal, state, and local regulatory requirements, contract specifications, and base operating constraints, as outlined in Chapter 3, Section 3.4. Hazardous materials management requirements are found in federal and state EPA and OSHA regulations, contract specifications and the Vandenberg AFB HMMP (30 SWP 32-7086). Hazardous waste management requirements are found in federal, state and local regulations, contract specifications and the Vandenberg AFB HWMP (30 SWP 32-7043A). Non-compliance with applicable regulatory requirements, human exposure to hazardous materials and wastes, or environmental release above permitted limits, would be considered adverse impacts.

4.4.1. Proposed Action

The contractor would be subject to hazardous materials and waste management regulations as required by federal, state and local laws and regulations, and would follow procedures as outlined in the Vandenberg AFB HMMP (30 SWP 32-7086) and Vandenberg AFB HWMP (30 SWP 32-7043A).

Implementing the Proposed Action would require the use of hazardous materials. As described in Chapter 3, Section 3.4, these hazardous materials are commonly used for construction projects, and would be the same types as currently used and managed on Vandenberg AFB. Because the Proposed Action would be spread over 12 months and a small number of workers would be working at any one time, there would not be a significant increase in the amounts of hazardous materials present on Vandenberg AFB. Thus no significant adverse impacts are anticipated.

Potential adverse effects could result from accidental releases of POLs from vehicle and equipment leaks, or the accidental release of bentonite during boring. Bentonite would be managed to minimize any fugitive dust emissions into the environment. All hazardous wastes would be properly managed and disposed of in accordance with applicable federal, state and local hazardous waste regulations, and the Vandenberg AFB HWMP (30 SWP 32-7043A). All hazardous wastes would be managed either during release response and clean-up, or during abatement removal actions. The bentonite boring fluid is typically stored in tanks at the drill site when not in use. After the bore is completed, any excess slurry remaining would be removed from the site and either reused by the drilling contractor or disposed of at an appropriate facility. Vandenberg AFB would not be responsible for hazardous materials and/or waste created by the project proponent.

Compliance with all applicable federal, state and local regulations, rules and requirements, and applicable Vandenberg AFB plans, would govern all actions associated with implementing the Proposed Action, and would minimize the potential for adverse effects.

Implementing the measures presented below would further minimize the potential for adverse impacts for hazardous materials or hazardous waste.

- All hazardous materials would be properly identified and used in accordance with manufacturer's specifications to avoid accidental exposure to or release of

hazardous materials required to operate and maintain construction equipment.

- All equipment would be properly maintained and free of leaks during operation. All necessary equipment maintenance and repairs would be performed in pre-designated controlled, paved areas to minimize risks from accidental spillage or release.

Potential IRP impacts are evaluated using DOD and Air Force guidance, and the FFSRA, as negotiated between Vandenberg AFB and the regulatory agencies with oversight of Vandenberg AFB IRP activities. Non-compliance with the FFSRA, human exposure to contaminants, or environmental release above permitted limits, would be considered adverse impacts.

Because sections of the proposed route would be installed within boundaries of some AOIs, AOCs, and IRP sites, there is the potential for encountering pollutants during implementation of the Proposed Action, as well as inadvertent interaction with IRP equipment and operations. In addition, many of the AOIs and AOCs have not undergone surveys or investigations, or results are not yet available. Therefore, the potential for contact with contaminants considered a risk to human health is unknown at this time. To minimize risks to workers at specific sites, the following measures would be implemented in areas where sites would be encountered:

- Because of the number of monitoring wells present along the road shoulder of Coast Road, all activities associated with the Proposed Action would be strictly restricted to the roadway to avoid damage to equipment. These monitoring wells are part of an agreement between Vandenberg AFB and state regulators; therefore any impacts to the wells must be avoided.
- To further avoid adverse effects, all activities associated with implementation of the Proposed Action would be coordinated with the 30 CES/CEVC Compliance Office prior to implementation of the Proposed Action so as not to interfere with IRP actions, damage IRP equipment or monitoring wells, or expose workers to contamination.

Additionally, the Proposed Action includes cable line installation in two areas where there is potential for worker exposure to contaminants of concern (COC). Segment 7 passes through IRP Site 50 (See site map in Appendix E), and lies within the area known to have the highest levels of contamination within the entire site (Shaw Environmental Inc. 2005). TCE levels have been detected at 18,900 ug/L in groundwater, which was measured at approximately 5.5 feet below ground surface (bgs) in the Spring of 2005. While workers may not encounter a TCE saturated zone during trenching at Site 50, TCE is a VOC and therefore exposure to the contamination in the form of soil vapor is a possibility, although at unknown levels. TCE is a known carcinogen and is suspected to affect the central nervous system with long-term exposure.

Segment 8 passes through IRP Site 60 (See site map in Appendix E), a former GSA gas station. COCs at Site 60 include gasoline (TPHg), benezene, toluene, ethylbenzene, xylene (BTEX), and methyl *tert*-butyl ether (MTBE) in the groundwater caused by leaking underground storage tanks. BTEX is a known carcinogen and MTBE is a suspected carcinogen in humans. Groundwater in this area was previously measured at 3.75 feet bgs (Tetra Tech 2006). Due to shallow water, there is the potential for worker exposure to COCs.

Additionally, Segment 14 passes through potential POL lines and Site 3 along Utah Avenue, which have the potential for TPH-diesel-gasoline contaminated soil.

4.4.2. No-Action Alternative

Under the No-Action Alternative, the proposed fiber optic network would not be installed and, therefore, there would be no change in the management or levels of hazardous materials and waste on Vandenberg AFB.

4.5. Human Health and Safety

4.5.1. Proposed Action

The contractor would comply with OSHA regulations, and other recognized standards and applicable Air Force regulations or instructions. Restricted public access to the construction sites would be provided through use of signs and fencing. The contractor must also provide for the health and safety of workers and all subcontractors who may be exposed to their operations or services. The contractor must submit a health and safety plan to the base and appoint a formally trained individual to act as

safety officer. The appointed individual would be the point of contact on all problems involving job site safety. During performance of work, the contractor must comply with all provisions and procedures prescribed for the control and safety of personnel and visitors to the job site. Therefore, human health and safety would not be adversely impacted by general construction hazards.

Biological hazards, including vegetation (i.e., poison oak and stinging nettle), animals (i.e., insects, spiders, and snakes), and disease vectors (i.e., ticks, rodents), exist at and near the proposed fiber optic cable route, and have the potential to adversely impact the health and safety of construction personnel. Adherence to federal OSHA regulations would minimize the exposure of workers to these hazards.

Unexploded Ordnance

Special precautions need to be taken in certain areas of Vandenberg AFB that were used as practice ranges for artillery firing, referred to as areas of potential UXO. Coordination with EOD prior to implementing the Proposed Action would ensure no adverse effects on human health and safety occur.

Noise

According to regulations of the federal OSHA, employees should not be subjected to sound exceeding an L_{eq} of 90 dB for an eight-hour period. This sound level increases by five dB for with each halving of time (e.g., four-hour period at 95dB). Exposure up to a L_{eq} of 115 dB is permitted for a maximum of only 15 minutes during an 8-hour workday and no exposure above 115 dB is permitted. For this analysis, OSHA standards are used as the "not to exceed" criteria as they are the most appropriate standards available.

The Proposed Action would temporarily increase the ambient noise levels within the project area and in neighboring areas during project implementation activities. Relatively continuous noise would be generated by construction equipment during activities such as the installation of the fiber optic cable into the road base. These continuous noise levels are generated from equipment that has source levels (at one meter) ranging from approximately 72.7 to 112.7 dB. As a sound source gets further away, the sound level decreases. This is called the attenuation rate. The rates are highly dependent on the terrain over which the sound is passing and the characteristics of the medium in which it is propagating. The rate used in these estimates was a decrease in level of 4.5 dB per doubling of distance. This average rate has been shown to be an accurate estimate from field data on grassy surfaces (Harris 1998). At 50 meters these levels range from 47.3 to 87.3 dB. Typical noise levels of heavy construction equipment are presented in Table 4.2. Adverse effects as a result of noise are expected to be minimal and less than significant.

4.5.2. No-Action Alternative

Under the No-Action Alternative, the proposed fiber optic network would not be installed and, therefore, there would be no impacts to human health and safety at Vandenberg AFB.

4.6. Transportation

For the purposes of this EA, impacts to the transportation system at Vandenberg AFB would be considered significant if a primary roadway could no longer service the traffic demands of that roadway; or if the project caused traffic to shift to a roadway that was incompatible with those traffic increases (i.e. inadequate pavement structure) or could cause potential safety problems, such as a large number of large trucks using a rural road with heavy pedestrian traffic.

4.6.1. Proposed Action

Under the Proposed Action, fiber optic cable lines would be installed within the primary roads on North Base including California Boulevard, 13th Street, Utah Avenue, and Washington Avenue. Additionally, on South Base cable lines would be installed within the primary roads including Arguello Road, Bear Creek Road and Coast Road.Installation of the fiber optic cable lines within the road base would cause construction-related delays on that roadway while construction was being performed. As cable lines would be installed in a sequential order (i.e. not all segments would be installed at the same time), only a small portion of the roadways on base would be affected over a particular time-span. Temporary congestion and minor traffic delays could result from construction, but impacts would be short-term. Construction-related trips would be a minor addition to existing traffic.

Table 4.2. Noise levels of heavy construction equipment.

Equipment Item	Maximum Noise Level (dBA) at 15 meters (50 feet)
All other equipment > 5 HP	85
Auger Drill Rig	85
Backhoe	80
Bar Bender	80
Boring Jack Power Unit	80
Chain Saw	85
Compactor (ground)	80
Compressor (air)	80
Concrete Batch Plant	83
Concrete Mixer Truck	85
Concrete Pump	82
Crane (mobile or stationary)	85
Dozer	85
Dump Truck	84
Excavator	85
Flat Bed Truck	84
Front End Loader	80
Generator (25 KVA or less)	70
Generator (more than 25 KVA)	82
Gradall	85
Grader	85
Horizontal Boring Hydraulic Jack	80
Insitu Soil Sampling Rig	84
Jackhammer	85
Paver	85
Pickup Truck	55
Pneumatic Tools	85
Pumps	77
Rock Drill	85
Scraper	85
Slurry Plant	78
Slurry Trenching Machine	82
Soil Mix Drill Rig	80
Tractor	84
Vacuum Excavator (vac-truck)	85
Vacuum Street Sweeper	80
Vibratory Concrete Mixer	80
Welder	73

(Source: Commonwealth of Massachusetts, Section 721.560 Construction Noise Control - http://www.nonoise.org/resource/construc/bigdig.htm)

Although significant impacts from the Proposed Action are not anticipated given the temporary nature of the construction on any given roadway and the good LOS levels of primary roads on Vandenberg AFB, the following measures would reduce the potential for adverse effects on the transportation system:

- The contractor would supply a traffic control plan that would cover all conditions to be encountered during construction, and which would be implemented to adequately facilitate the movement of traffic.
- Construction on mission-critical segments of road would be coordinated with the 30th Launch Group in order to ensure no mission impacts.
- Roadway users would be provided with adequate notice of when roadways would be under construction, so that users could plan for alternate routes when possible.

- All construction areas would be backfilled to grade and returned to like condition by replacing asphalt, concrete, landscaping, or earthen materials.

4.6.2. No-Action Alternative

Under the No-Action Alternative, the proposed fiber optic network would not be installed and, therefore, no impacts to the transportation system at Vandenberg AFB would occur.

4.7. Water Resources

In California, the SWRCB and the RWQCB administer the Clean Water Act (CWA) and state water regulations. The CWA defines the standards for water quality and mandates that treated water discharged to surface water or to the ocean are subject to the requirements of a NPDES General Permit. The RWQCB is responsible for management of the NPDES Permit process for California. The Central Coast RWQCB is the local agency responsible for the Vandenberg AFB area. The NPDES Permit for construction activities ensures that water discharged from a site meets water quality standards at the point of discharge. The NPDES Permit, along with contract requirements, the Frac-Out Contingency Plan, and standard work practices, reduces and eliminates storm water and non-storm water discharges associated with proactive construction activities. BMP controls and site inspections evaluate and improve the effectiveness of the implementation of required actions and controls.

The California Porter-Cologne Water Quality Act provides a framework for establishing beneficial uses of water resources and the development of local water quality objectives to protect these beneficial uses. State regulations require a Waste Discharge Requirement (WDR) for permitting discharge. A Report of Waste Discharge (RWD) (similar to an NPDES permit application) is required for actions that will involve discharge of waste to surface and/or groundwater. The California Porter-Cologne Water Quality Act implements the NPDES program for the state.

4.7.1. Proposed Action

Adverse impacts to water resources would occur if the Proposed Action 1) caused substantial flooding or erosion; 2) adversely affected surface water quality to the creeks or rivers; or 3) adversely affected groundwater or water quality to localized water resources.

The Proposed Action would require a NPDES Permit as required by Section 402 of the CWA because the total disturbed area of the Proposed Action would be greater than one acre (approximately 106 acres). The contractor would develop and implement a SWPPP to maintain compliance with the NPDES Permit. All permit conditions and BMPs would be implemented to minimize the potential for adverse impacts to local water resources. During site preparation and construction activities, storm water/erosion BMPs would be implemented during and after any clearing, excavation, and grading. Long-term BMPs would be put in place to address storm water erosion after project completion. Spill protection measures and a Frac-Out Contingency Plan, including placement of temporary berms and silt fencing, would be implemented to prevent contamination and to contain bentonite in the event of an accidental release into the environment. After cable installation, any disturbed/bare ground areas would be revegetated with appropriate plant and seed mix. In addition, the contractor would implement all NPDES Permit requirements until the Central Coast RWQCB officially terminates the SWPPP or the SWRCB officially terminates the NDPES Permit covering the Proposed Action.

A Notice of Intent was coordinated with 30 CES/CEV prior to being submitted to the SWRCB. In July 2005, the SWRCB issued the contractor a Waste Discharge Identification Number for this project. The contractor would also submit a Notice of Termination to the Central Coast RWQCB after coordination with 30 CES/CEV to ensure all permit termination requirements are met.

A CWA Section 401 Water Quality Certification from the Central Coast RWQCB and CWA Section 404 Permit from the U.S. Army Corps of Engineers would not be required under the Proposed Action because no direct impacts to water bodies or wetlands would occur. There are no direct discharges from the Proposed Action into any of the CWA Section 303 (d) listed water bodies, San Antonio Creek, and Santa Ynez River on Vandenberg AFB.

The contractor would implement all permit conditions; contract requirements (including any federal guidelines and regulations addressing site processes for all compliance medias); Discharge to Grade program; Frac-Out Contingency Plan,

and Vandenberg AFB Management Plan's requirements. The contractor would incorporate these requirements into work practices and procedures to ensure compliance for all project related activities. With the implementation of these procedures and requirements, adverse effects to water resources would be less than significant, as described below.

Surface Water and Floodplains

The Proposed Action would entail activities including fiber optic cable installation, installation of 82 new manholes, handholes, and pullboxes, and maintenance and upgrade work at 438 existing manholes, handholes, and pullboxes. These activities were considered in the analysis of environmental consequences within the geographical water resources areas described in Chapter 3.

Proper management of materials and wastes during cable line and manholes installation would reduce or eliminate the potential for contaminated runoff. The use of POLs during installation, the use of bentonite in the boring process, and IRP COCs as previously discussed, lead to the potential for releasing pollutants and adversely affecting water resources. This potential would be greatest during the rainy season.

As required by the NPDES permit, BMPs would be implemented to properly manage materials. Storm water or wastewater discharges that may occur during installation work at manholes, handholes and pullboxes would also be managed through implementation of BMPs, as required by the NPDES permit. The Frac-out Contingency Plan and the Discharge To Grade program would also assist with the management of storm water and wastewater discharges. The NPDES Permit would cover all installation and lay down areas. Implementing BMPs as part of the NPDES Permit to reduce and/or eliminate project-associated runoff would further reduce the potential for adverse effects, especially during the rainy season. With these measures in place, adverse effects to surface water and floodplains would be less than significant.

Groundwater

The Vandenberg AFB water supply primarily comes from water purchased from the California Department of Water Resources State Water Project. Four wells located in the San Antonio Creek-Barka Slough area are used to supplement the Vandenberg AFB state water during annual maintenance periods. The greatest threat to groundwater is contamination from hazardous material or waste releases that could infiltrate an aquifer. The only local ground drinking water sources are the water wells located near Barka Slough, which are approximately two miles from the closest fiber optic cable installation.

The Proposed Action includes cable installation in two areas where the groundwater has been measured at shallow depths. Segment 7 passes through IRP Site 50, where TCE contamination exists, as discussed in Section 4.4.1. Groundwater in this area was measured at 5.5 feet bgs. Segment 8 passes through IRP Site 60, where contaminants in the groundwater are caused by leaking USTs, as discussed in Section 4.4.1. Groundwater in this area was previously measured at 3.75 feet bgs. In order to avoid impacts to groundwater in these areas, fiber optic cable installation would be placed at the most shallow depth possible (within the upper 12 to 18 inches of the ground). Additionally, CITS installation at these two sites would occur in the late summer/early fall when groundwater levels are generally the lowest. With these measures in place, adverse effects to groundwater would be less than significant.

4.7.2. No-Action Alternative

Under the No-Action Alternative, the proposed fiber optic network would not be installed and, therefore, no impacts to water resources would occur.

4.8. Cumulative Impacts

Adverse cumulative impacts (hereinafter referred to as "cumulative impacts") result from the incremental effect of an action when added to other past, present, and reasonably foreseeable future actions, regardless of the agency that undertakes these other actions. Cumulative impacts can result from actions whose adverse impacts are individually minor or negligible, yet, over a period of time, are collectively significant.

As discussed in Chapter 1, Section 1.3 *Scope of the Environmental Assessment*, installation of two additional cable line segments (Lion's Head and VTRS) would occur concurrently with the Proposed Action as part of the CITS network installation and upgrade. Analyses of

environmental consequences of installing those two cable segments were previously performed (Tetra Tech 2000; USAF 2004b). An analysis of the potential cumulative impacts from installation of those two segments in addition to the 16 segments analyzed in this EA is presented below.

To fully assess cumulative air quality impacts, impacts from the installation of the Proposed Action segments were considered in conjunction with those from the installation of the Lion's Head and VTRS segments. Estimates of the cumulative daily and total emissions from all three construction activities were made and can be found in Appendix D, Table D-5. The cumulative daily emissions were estimated to be 352 pounds of CO, 428 pounds of NO_x, 266 pounds of PM_{10}, 59 pounds of ROC, and 24 pounds of SO_x. The project emissions were estimated to be 27.31 tons of CO, 24.18 tons of NO_x, 4.01 tons of PM_{10}, and 3.36 tons of ROC, and 0.32 tons of SO_x. The cumulative emissions from the Proposed Action and the fiber optic cable installation of the Lion's Head and VTRS segments would not exceed the significance thresholds of 548 lbs/day or 100 tons/year. Therefore, no significant cumulative impacts to the region's air quality would occur from completion of the Proposed Action, along with the installation of the Lion's Head and VTRS segments.

Adverse effects to biological and cultural resources should be minimized with the implementation of the protective measures described in Section 2.1.6 of this EA, the Final Mitigation Plan for the Lion's Head segment (Appendix C of Tetra Tech 2000), and the measures described in Section 2.1.2.6 of the VTRS EA (USAF 2004b). With these measures in place, no significant cumulative impacts are anticipated.

Impacts to earth resources (geology and soils) in areas of the Lion's Head segment where erosion and landslides could be of concern would be avoided by performing installation along roadsides. Disturbed areas would be backfilled after installation and revegetation would occur where necessary. No impacts to earth resources are anticipated from the Proposed Action or from the VTRS segment installation as the methods selected for installing subsurface fiber optic cable would not adversely affect geology or soils, given the depth of and location of the cable installation. Tsunami or liquefaction hazards are not anticipated in any project areas. With the above measures in place, no significant cumulative impacts are anticipated.

When considered in conjunction, the installation of all 18 segments of cable lines, including those covered under the Proposed Action and the Lion's Head and VTRS EAs, was found to have no significant cumulative impact on Environmental Justice, as all installation activities would be confined to Vandenberg AFB and not affect minority communities.

Any hazardous materials/wastes encountered or generated during the installation of all 18 cable line segments would be managed in strict compliance with all applicable regulations including 30 SW Plan 32-7086, *Hazardous Materials Management Plan*, and 30 SW Plan 32-7043A, *Hazardous Waste Management Plan*, to avert the potential for adverse impacts. Implementation of the protective measures described in Section 2.1.6 of this EA, as well as those listed in the Final Mitigation Plan for the Lion's Head segment (Appendix C of Tetra Tech 2000), and in Section 2.1.2.6 of the VTRS EA (USAF 2004b) would avoid or minimize any potential adverse effects. No significant cumulative impacts are anticipated.

Given the contractor's requirement to comply with OSHA, Cal-OSHA, and all other applicable federal, state, and local regulations, no adverse impacts and therefore no significant cumulative impacts to Human Health and Safety are anticipated.

No significant cumulative impacts are anticipated in regards to land use as none of cable line installations would change land use or affect land use planning at Vandenberg AFB.

All cable line installation activities would be performed in accordance with Vandenberg AFB's Pollution Prevention Management Plan. Therefore there would be no adverse impacts, and no significant cumulative impacts, to Vandenberg AFB pollution prevention program or goals.

No adverse impacts to socioeconomics, and therefore no significant cumulative impacts, are expected from installation of the 18 cable line segments given the short-term nature of the activities and the minimal manning levels.

Fiber optic cable installation projects do not generate high levels of solid waste. The amounts of solid waste anticipated during installations of all 18 cable lines segments would be below levels sufficient to result in any adverse impacts and

would be minimized by recycling when possible. Contractors would also be required to appropriately dispose of all solid waste either at the Vandenberg AFB landfill as appropriate, or off of Vandenberg AFB property; therefore no significant cumulative effects are anticipated.

Installation of the Lion's Head segment would not occur along a primary road on North Base and for the reasons described in Section 3.6 of this EA would be unlikely to impact the transportation system or roadway conditions on Vandenberg AFB. A small portion (approximately 1.25 miles of 11 miles) of VTRS would occur along Arguello Road, a primary road on South Base. However no significant cumulative impacts are anticipated because, as described in Section 4.6.1 of this EA, the work on each segment is expected to be short-term and installation of the segments would be sequential, thereby minimizing any impacts to the Vandenberg AFB transportation system from the VTRS and Proposed Action installations.

The installations of the Lion's Head and VTRS segments, as well as the Proposed Action, would be subject to all requirements contained in NPDES Permits. Implementation of the protective measures described in Section 2.1.6 of this EA, as well as those listed in the Final Mitigation Plan for the Lion's Head segment (Appendix C of Tetra Tech 2000), and in Section 2.1.2.6 of the VTRS EA (USAF 2004b) would avoid or minimize any potential adverse effects. No significant cumulative impacts to water resources are anticipated.

Other recent or current projects at Vandenberg AFB for which NEPA analysis, including cumulative impacts analysis, has been completed or will be completed if required, include: the deactivation of Atlas and Titan Launch Programs; the demolition and abandonment of Atlas and Titan facilities; the deactivation of the Peacekeeper Program; the construction of a facility for the Western Range Command Transmit Site; the replacement of the waterline between SLC-4 and SLC-6; and the emergency repair and retrofit of the 13th Street Bridge.

Upcoming projects identified as having the potential to contribute to cumulative impacts when considered in conjunction with the Proposed Action and for which NEPA analysis, including cumulative impacts analysis, has been or will be performed include: the replacement of military family housing (MFH), the expansion of MFH, and the replacement of the 13th Street Bridge over the Santa Ynez River. These projects are planned to begin no earlier than 2008.

Additionally, an IRP treatability study is planned for mid-2006 in the vicinity of Segments 7 and 14. The exact location of the study area has yet to be determined at this time. Also, an interim removal action (IRA) is planned at IRP Site 3, in proximity to Segment 14. The IRA would include excavation of large amounts of soil, however, the exact borders of excavation have yet to be determined. The project would be expected to last one and a half to two months and begin prior to October 2006. Both of these projects would be coordinated with the CITS project in order to ensure any potential adverse impacts are avoided.

To ensure that no significant cumulative impacts result from Vandenberg AFB projects occurring concurrently or non-currently, Vandenberg AFB includes environmental contract specifications and mitigation/protective measures as necessary in all projects. Actions are taken during the planning process to ensure adverse impacts are minimized or avoided all together as projects are reviewed under NEPA. Prior projects are also considered to ensure no levels of acceptable impacts are exceeded.

With these practices in place, and given that all Vandenberg AFB projects are designed and implemented in full compliance with applicable laws and regulations and mitigation and protective measures are developed in coordination with appropriate regulatory agencies, the described projects, in conjunction with the installation of the fiber optic cable for the CITS upgrade, would not result in significant cumulative impacts.

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5. Persons and Agencies Contacted

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7. Distribution List

California Coastal Commission, Federal Consistency Review, San Francisco, CA

California Native Plant Society, Los Osos, CA

California Regional Water Quality Control Board, Central Coast Region, San Luis Obispo, CA

Environmental Defense Center, Santa Barbara, CA

La Purisima Audubon Society, Lompoc, CA

Santa Barbara County Air Pollution Control District, Project Review, Santa Barbara, CA

Santa Barbara Museum of Natural History, Santa Barbara, CA

Santa Ynez Chumash Indian Reservation, Tribal Elders Council, Santa Ynez, CA

U.S. Fish and Wildlife Service, Ventura Field Office, Ventura, CA

University of California, Museum of Systematics & Ecology, Santa Barbara, CA

Lompoc Public Library, Lompoc, CA

Santa Barbara Public Library, Santa Barbara, CA

Santa Maria Public Library, Santa Maria, CA

University of California, Library, Santa Barbara, CA

Vandenberg AFB Library, Vandenberg AFB, CA

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APPENDIX A

Maps of CITS Route Segments

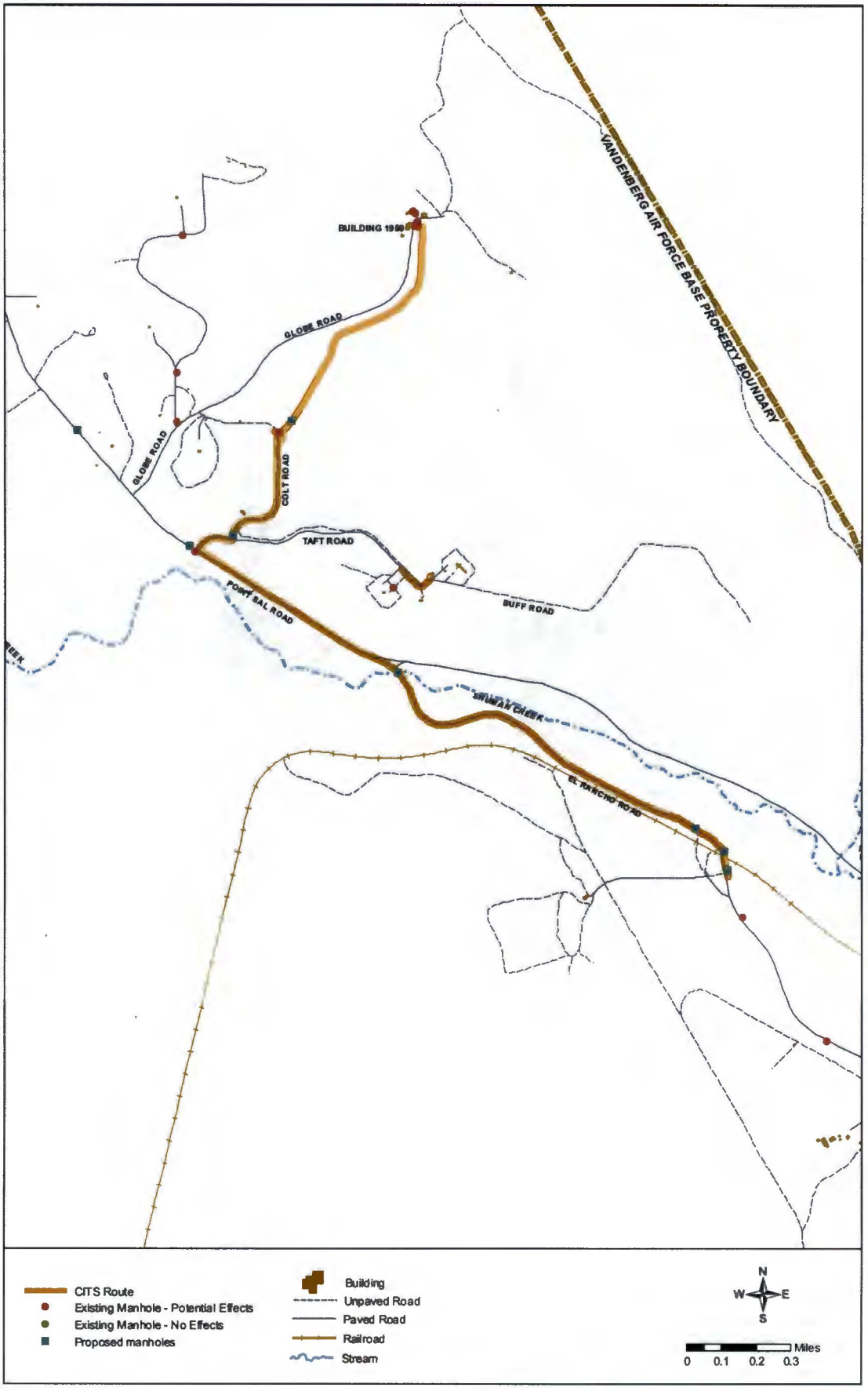


Figure A-1. Segment 1 of the proposed CITS route.

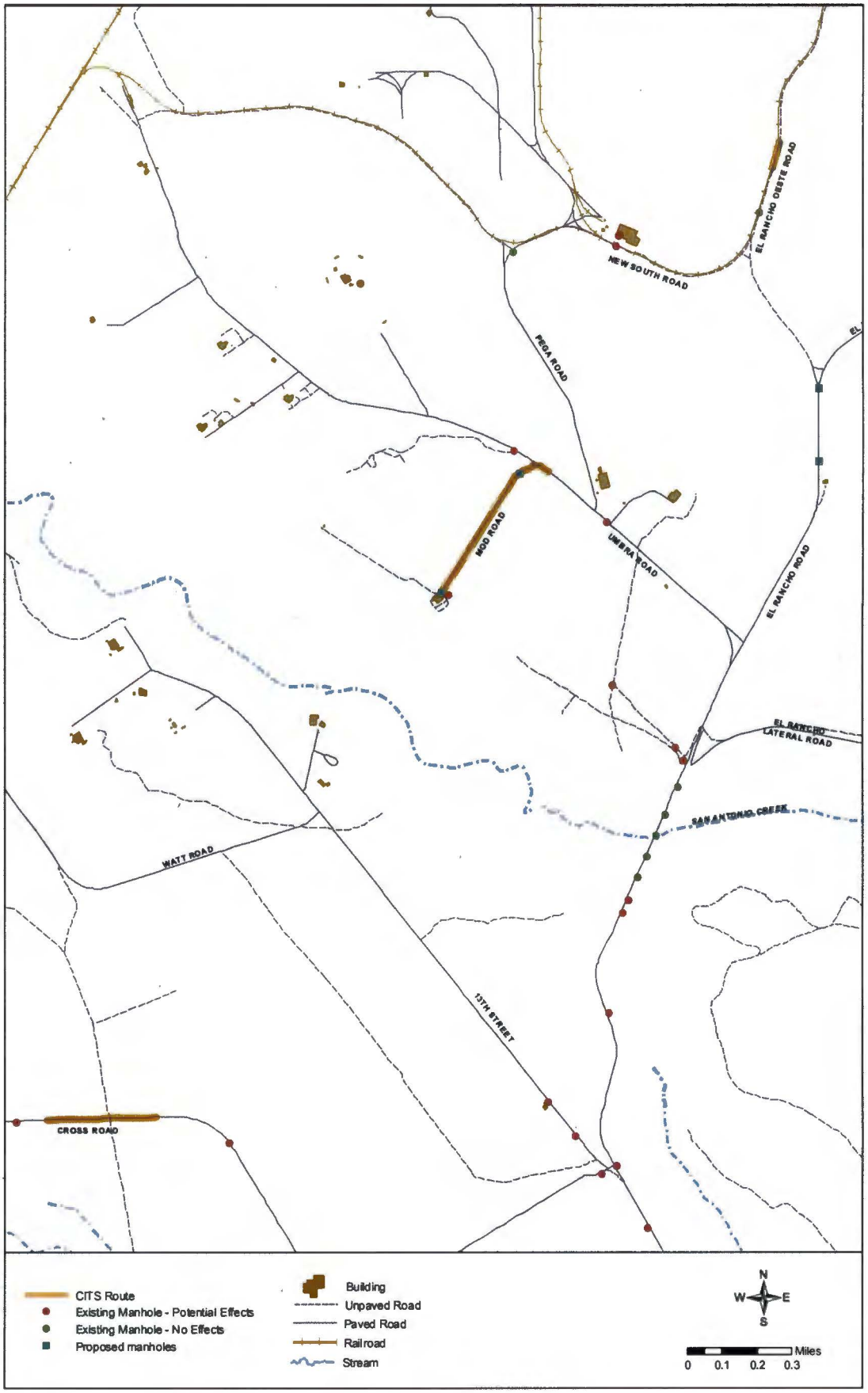
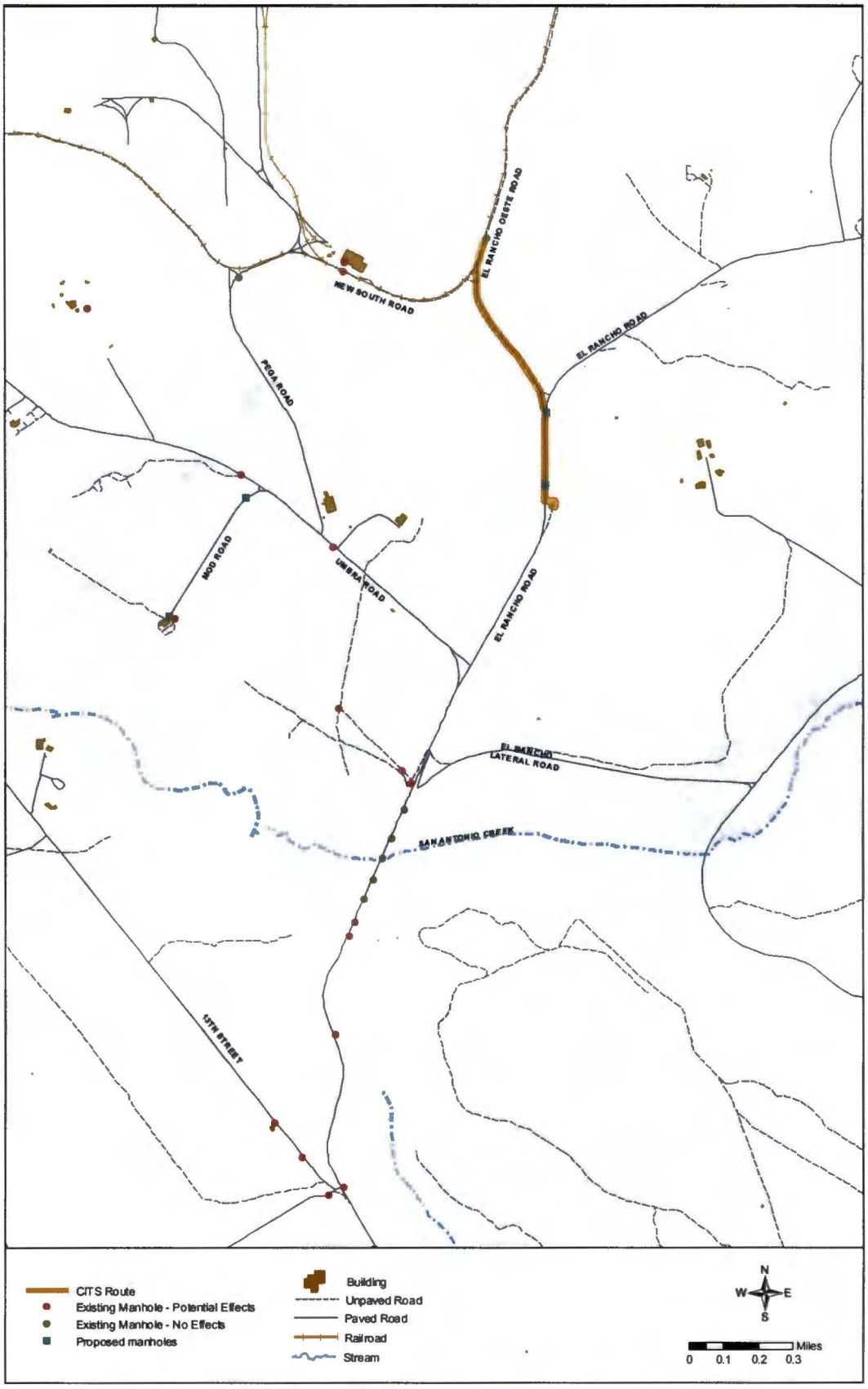


Figure A-2. Segment 2 of the proposed CITS route.



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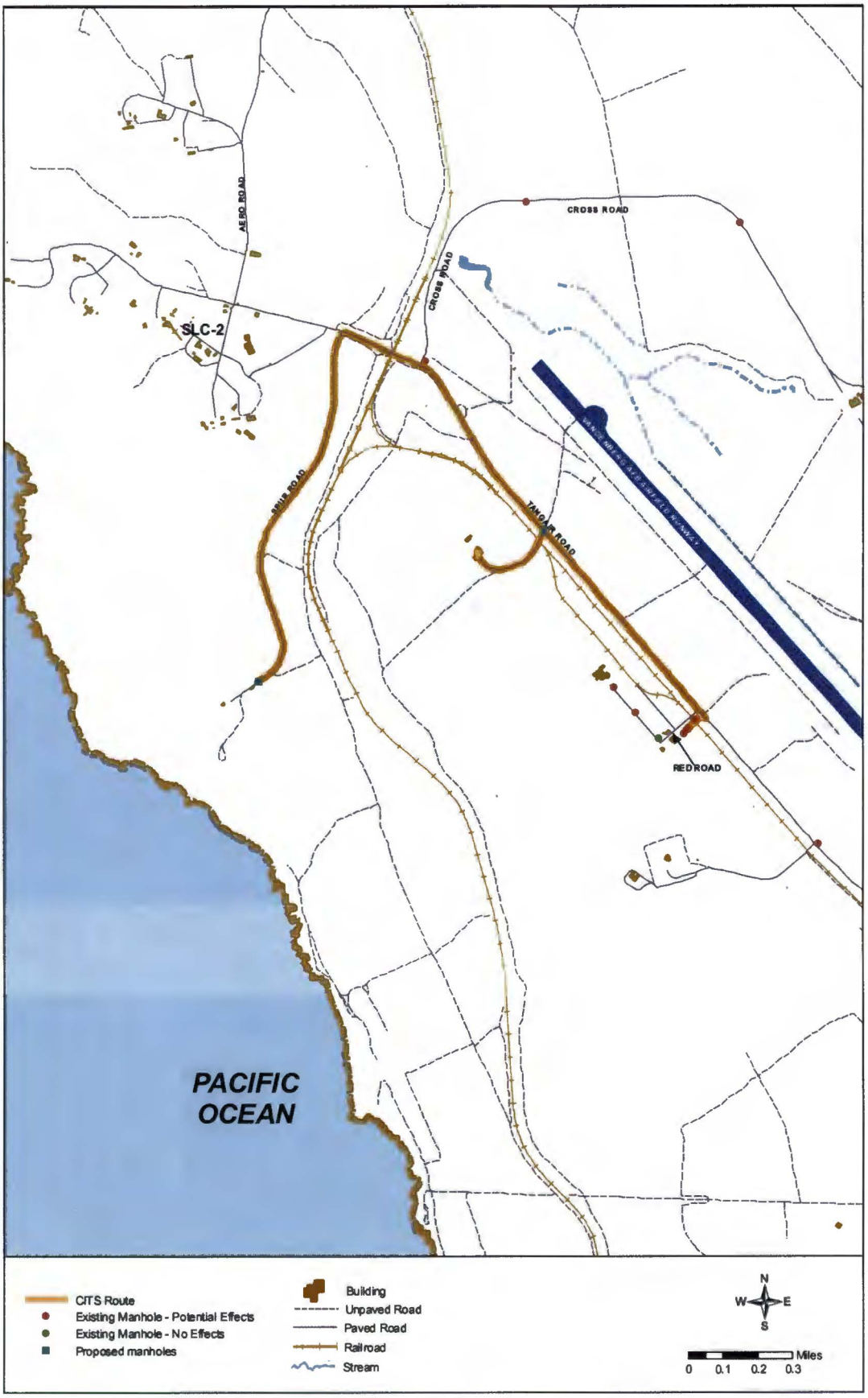

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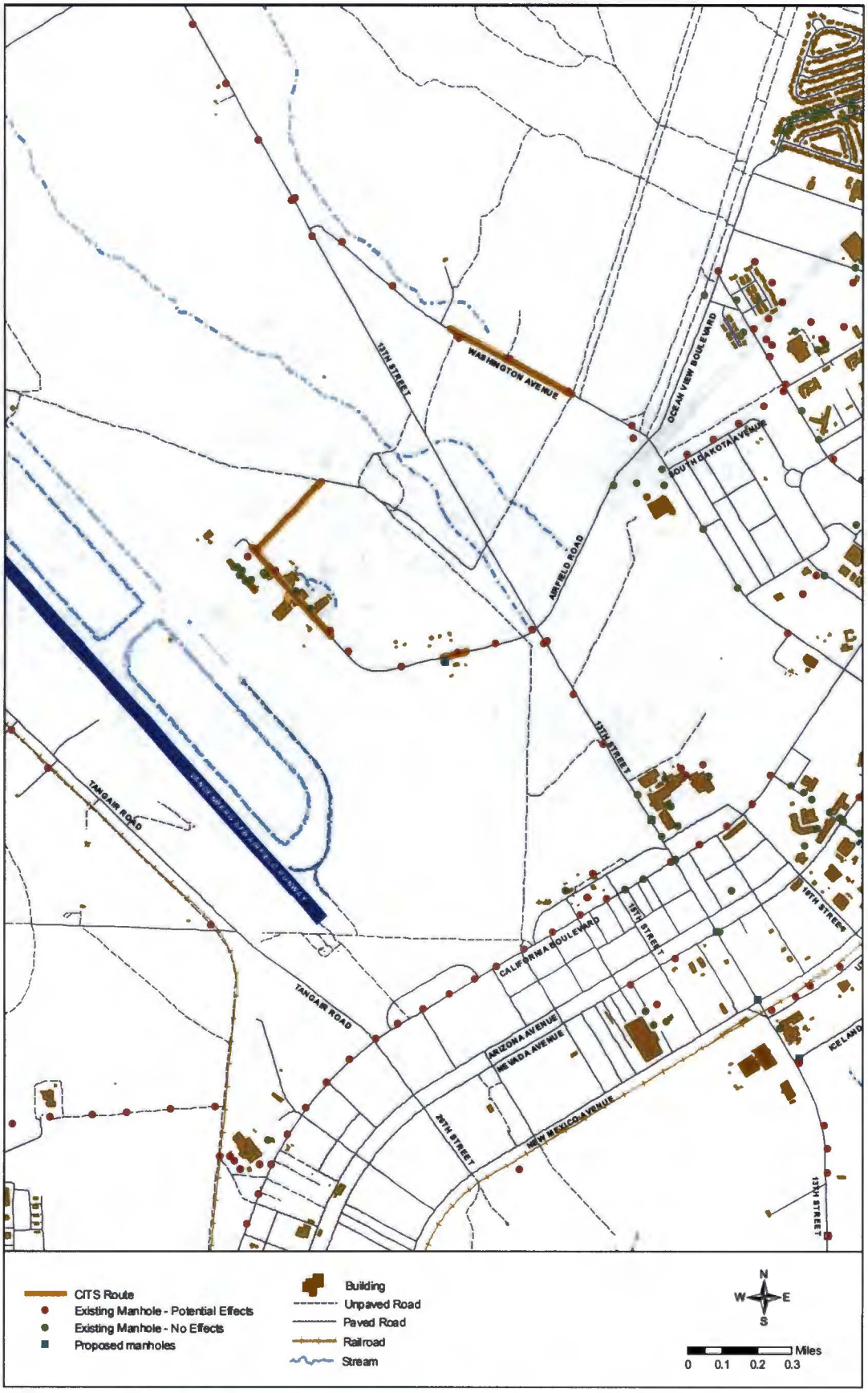

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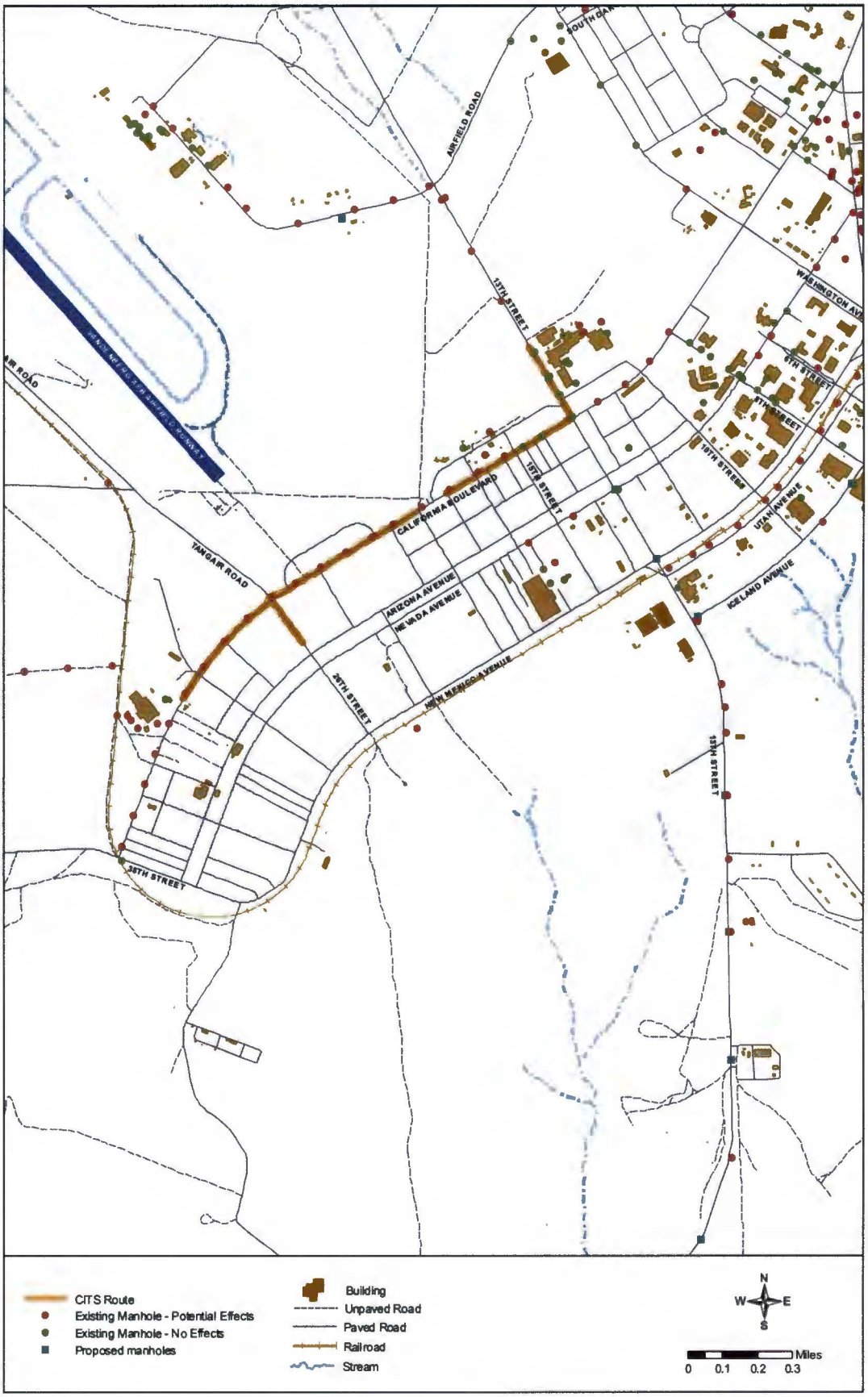

Figure A-6. Segment 6 of the proposed CITS route.

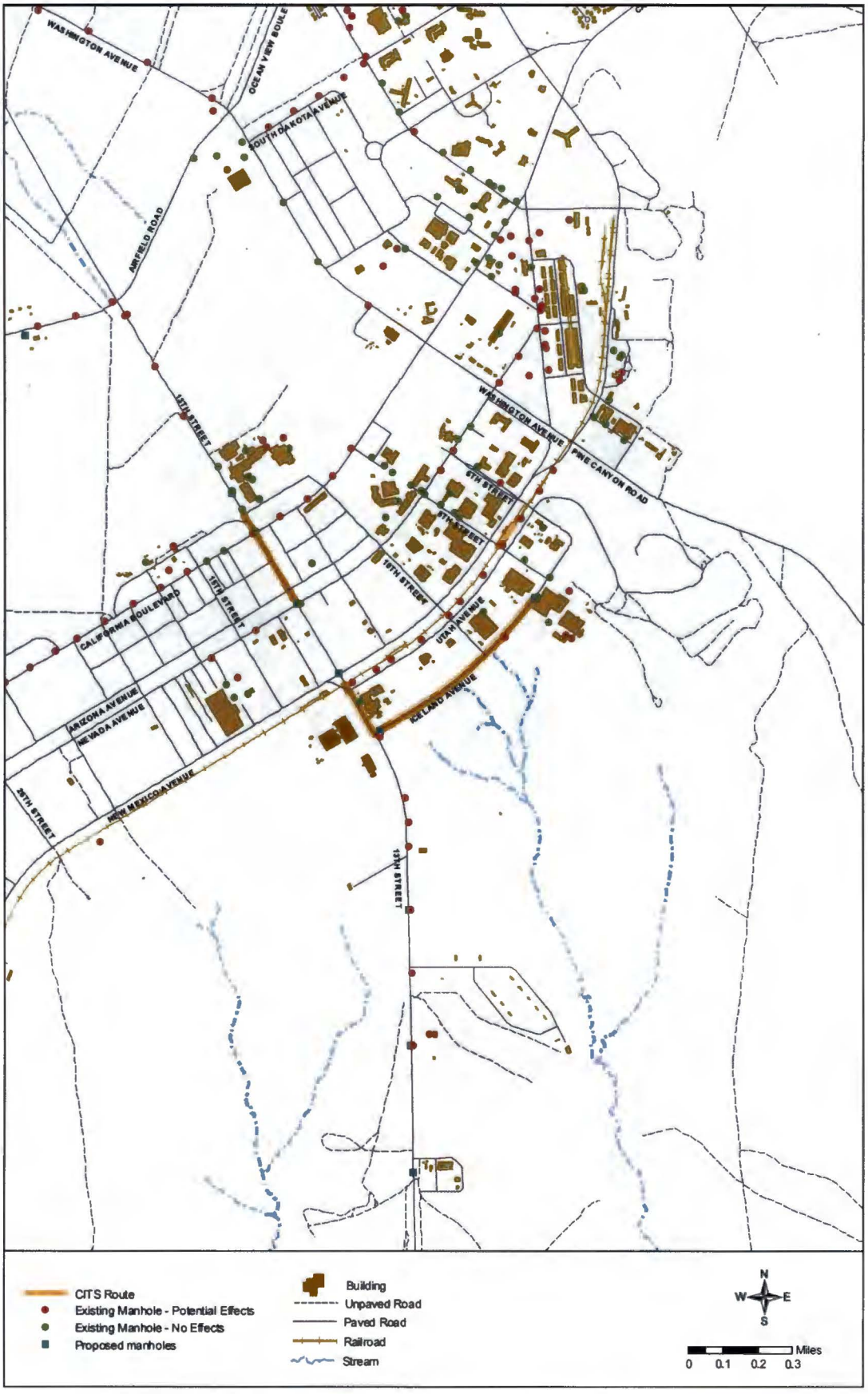

Figure A-7. Segment 7 of the proposed CITS route.

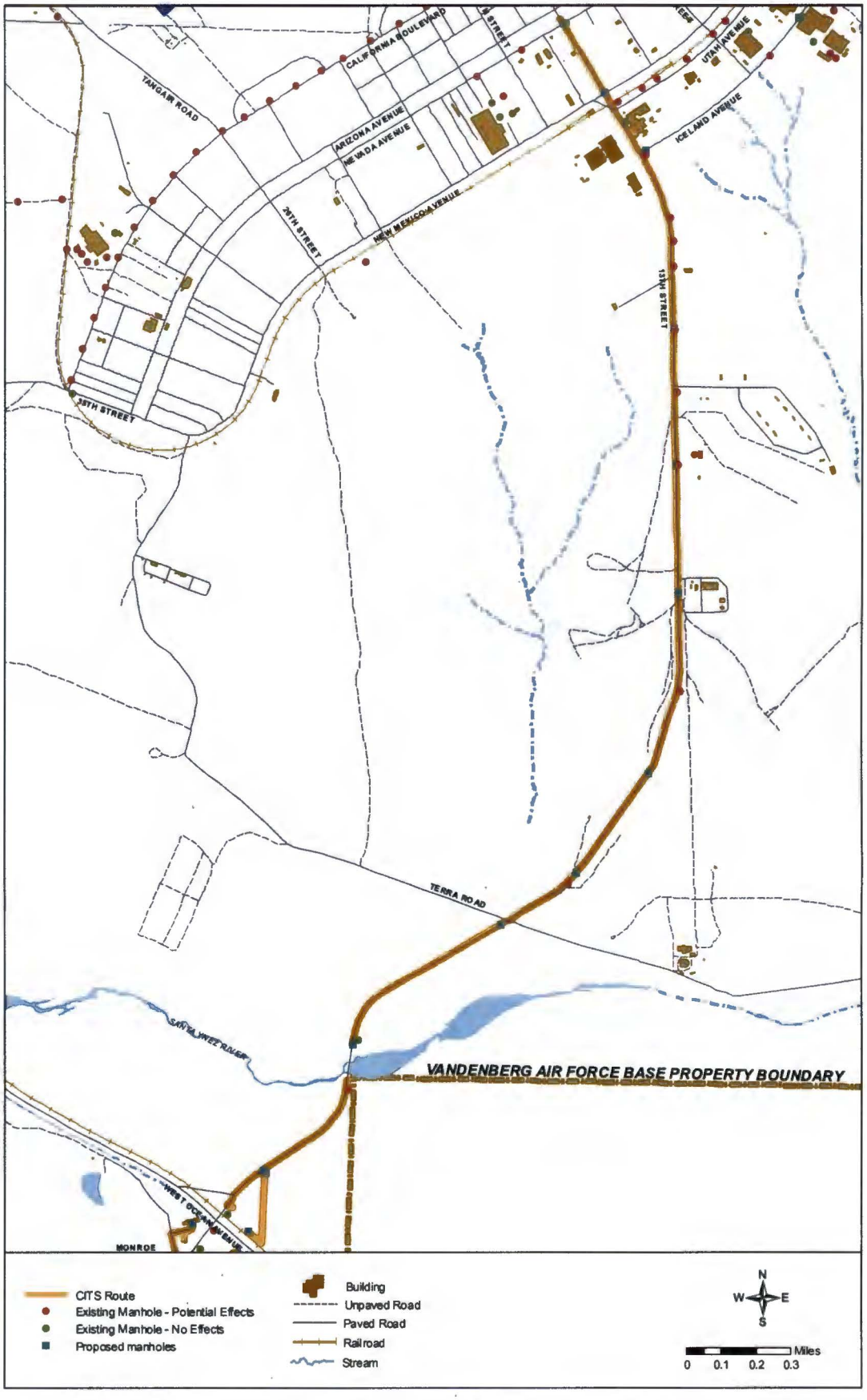

Figure A-8. Segment 8 (north) of the proposed CITS route.

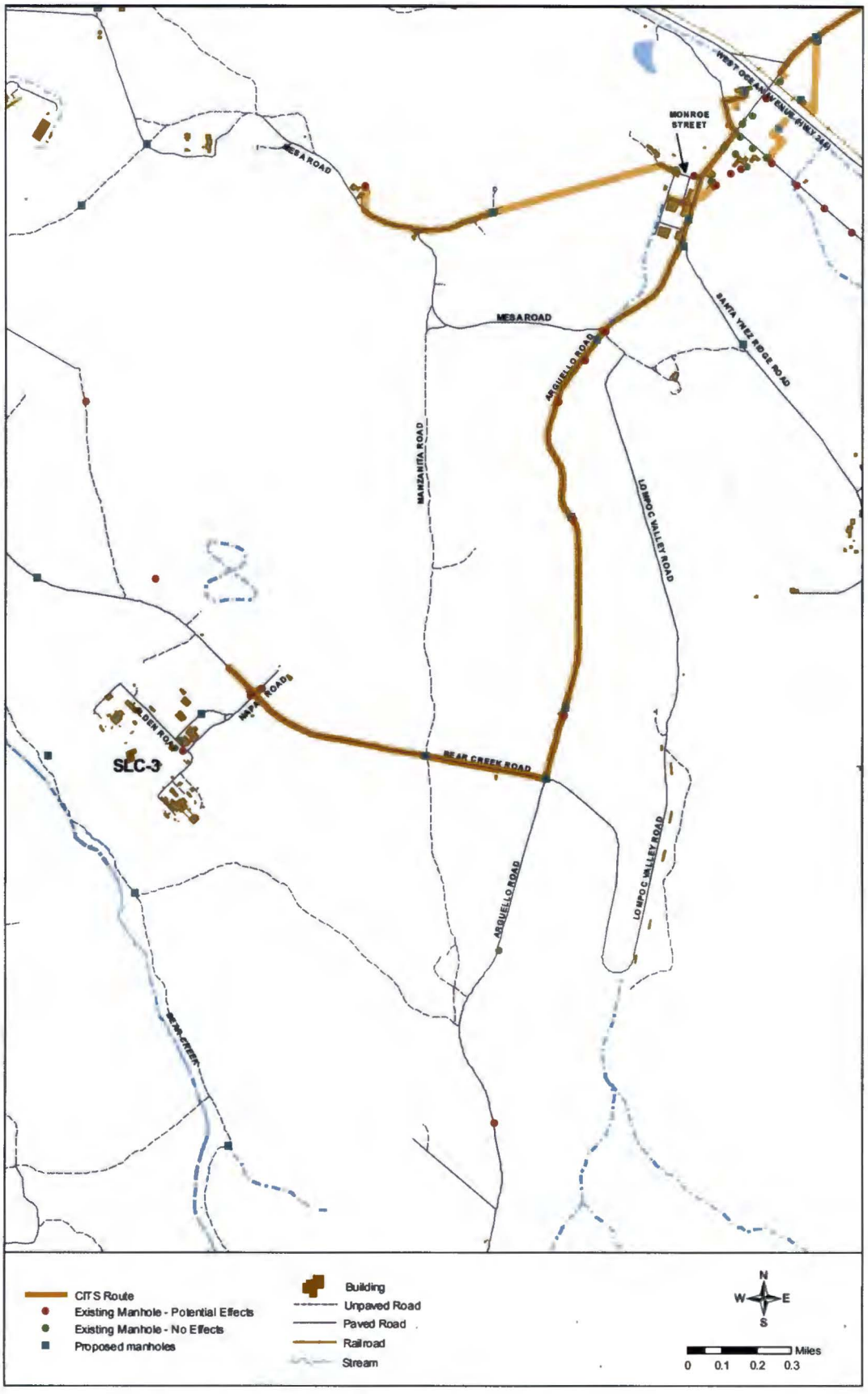

Figure A-9. Segment 8 (south) of the proposed CITS route.

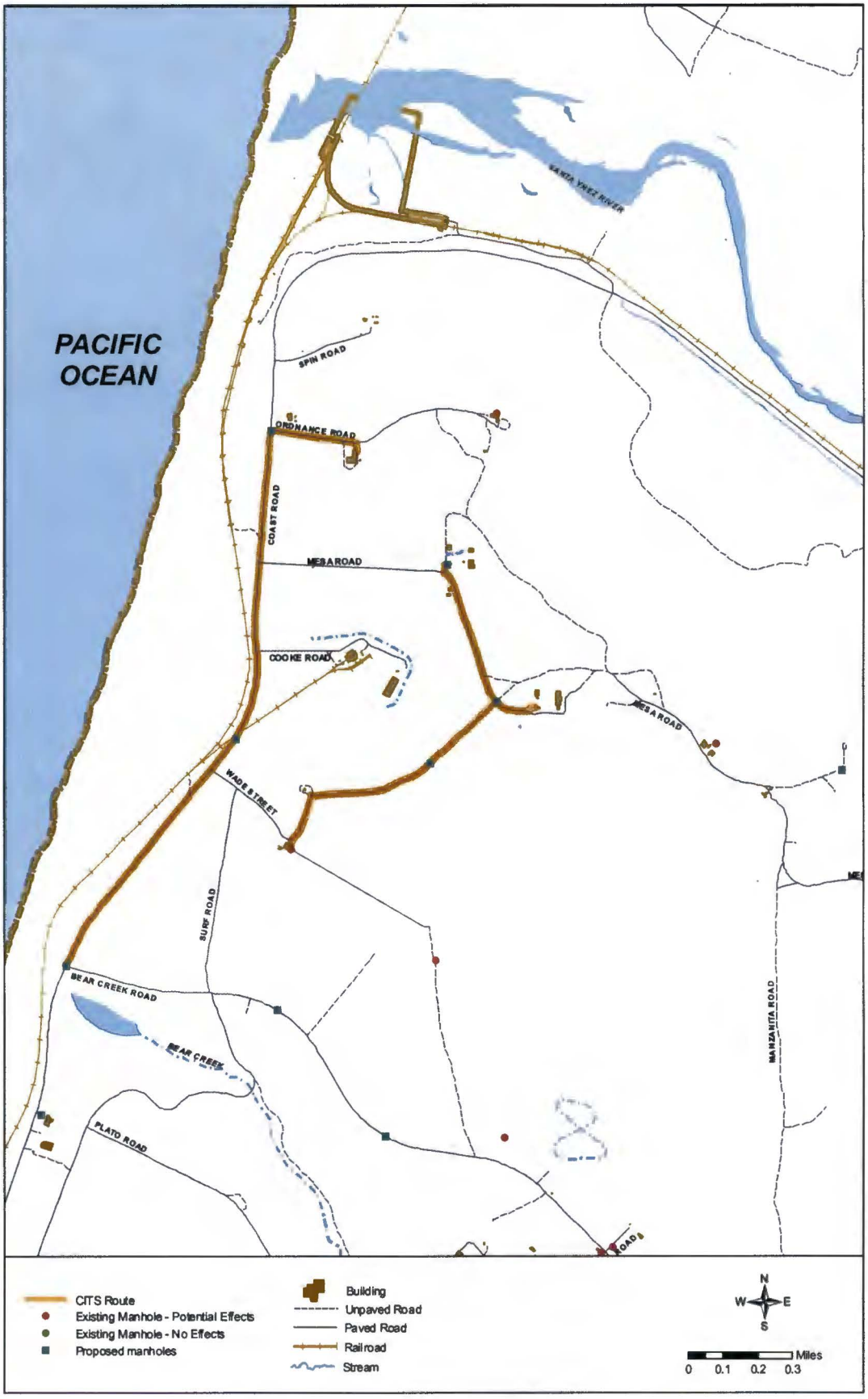

Figure A-10. Segment 9 of the proposed CITS route.

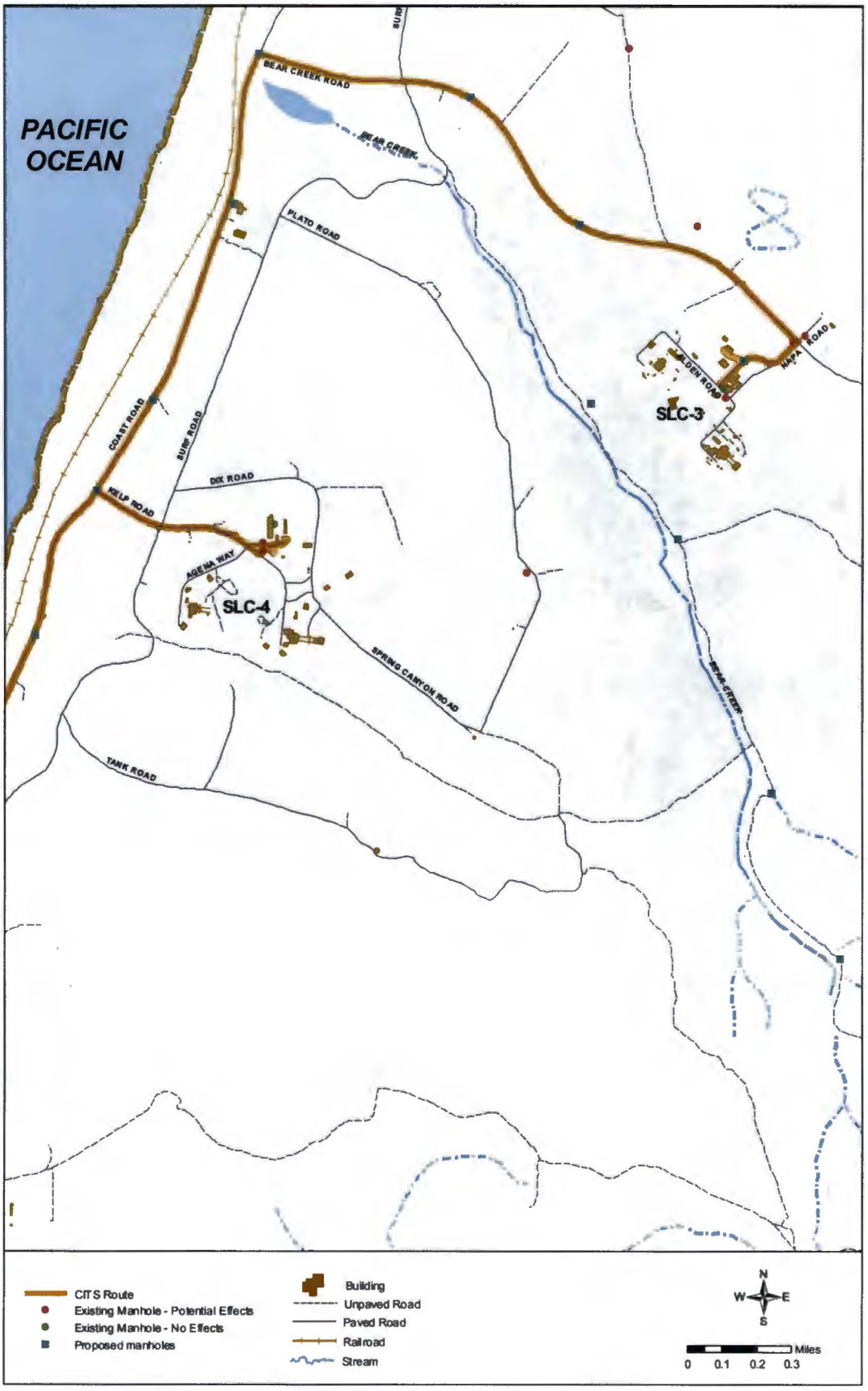

Figure A-11. Segment 10 (north) of the proposed CITS route.

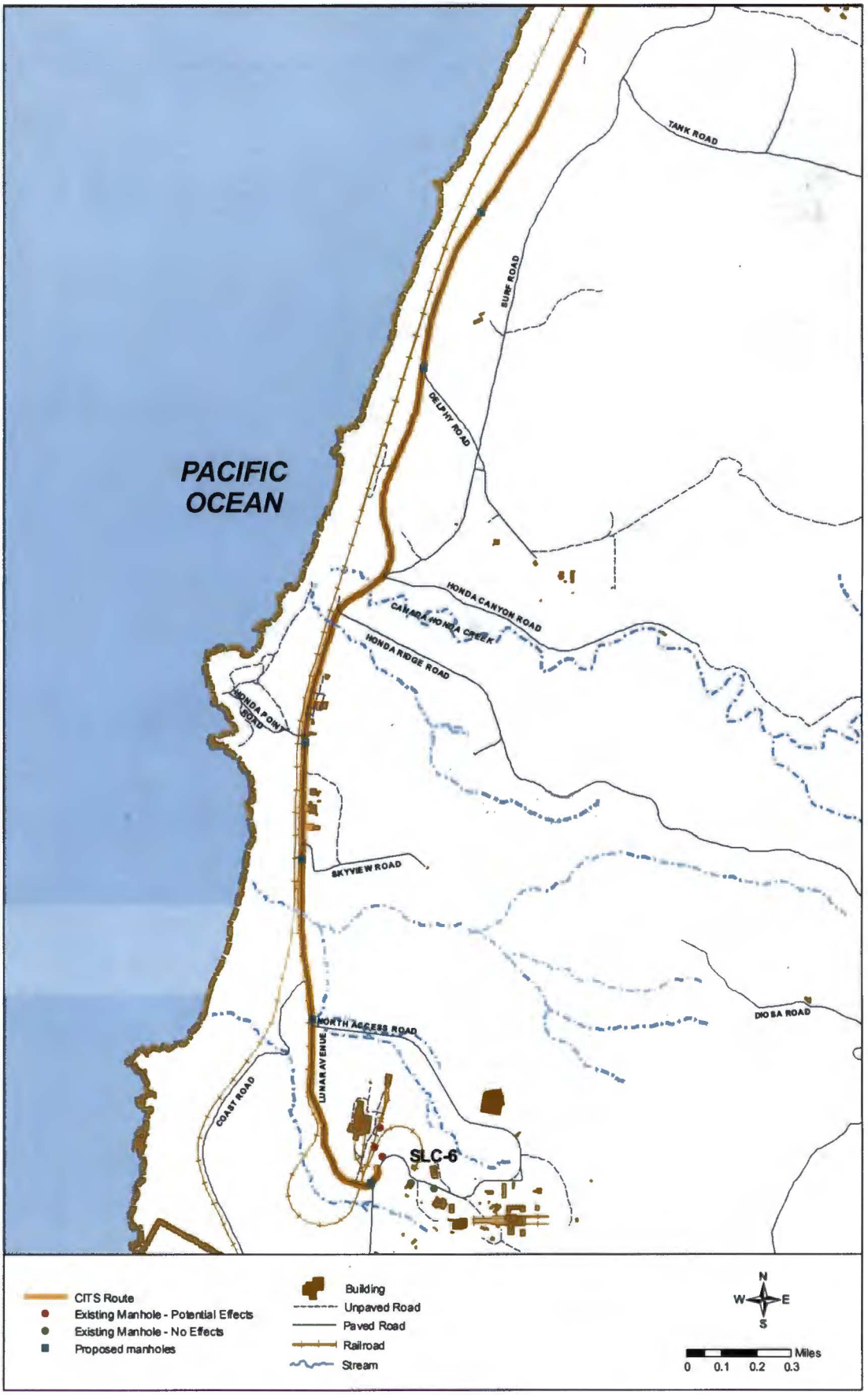

Figure A-12. Segment 10 (south) of the proposed CITS route.

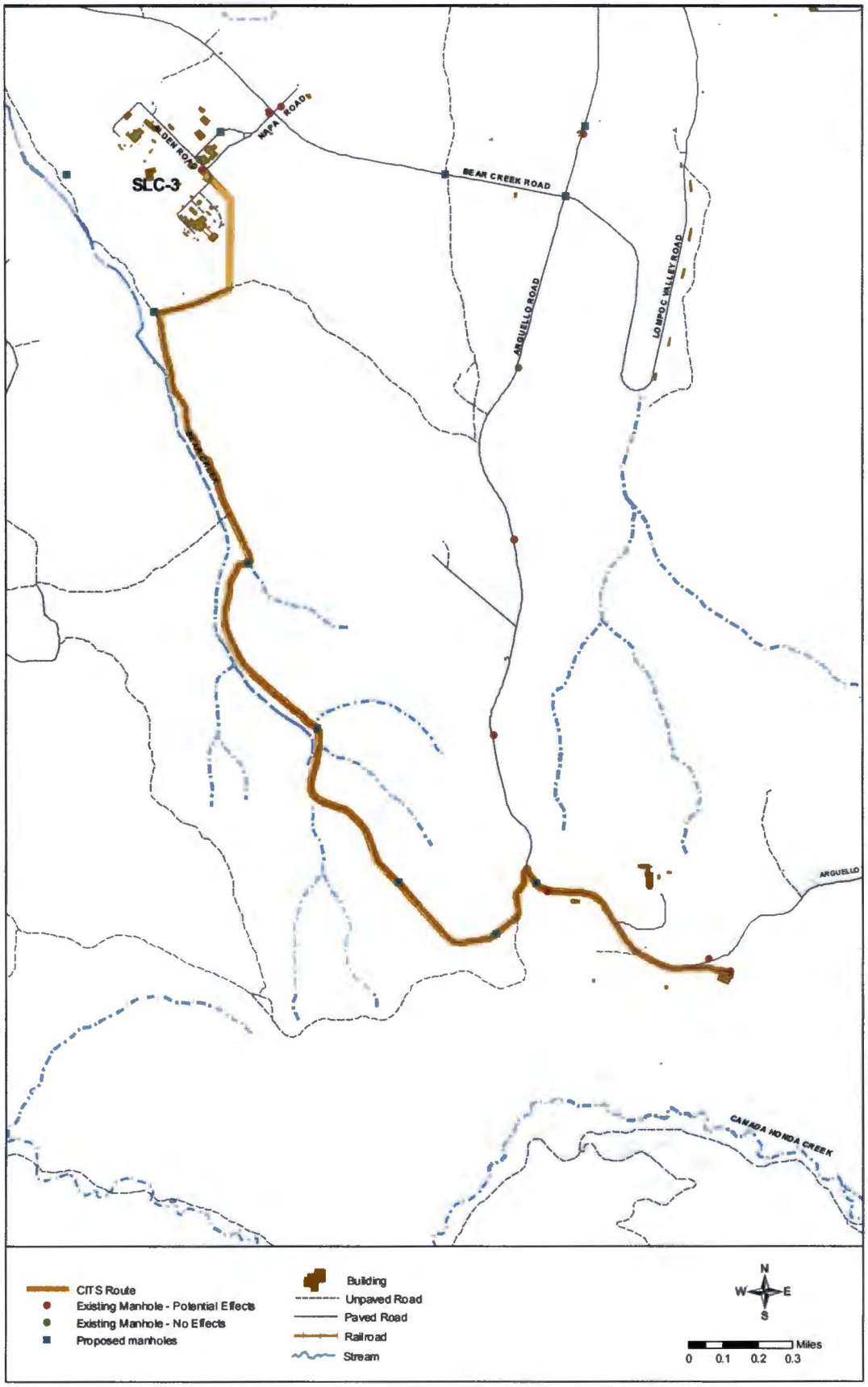

Figure A-13. Segment 11 of the proposed CITS route.

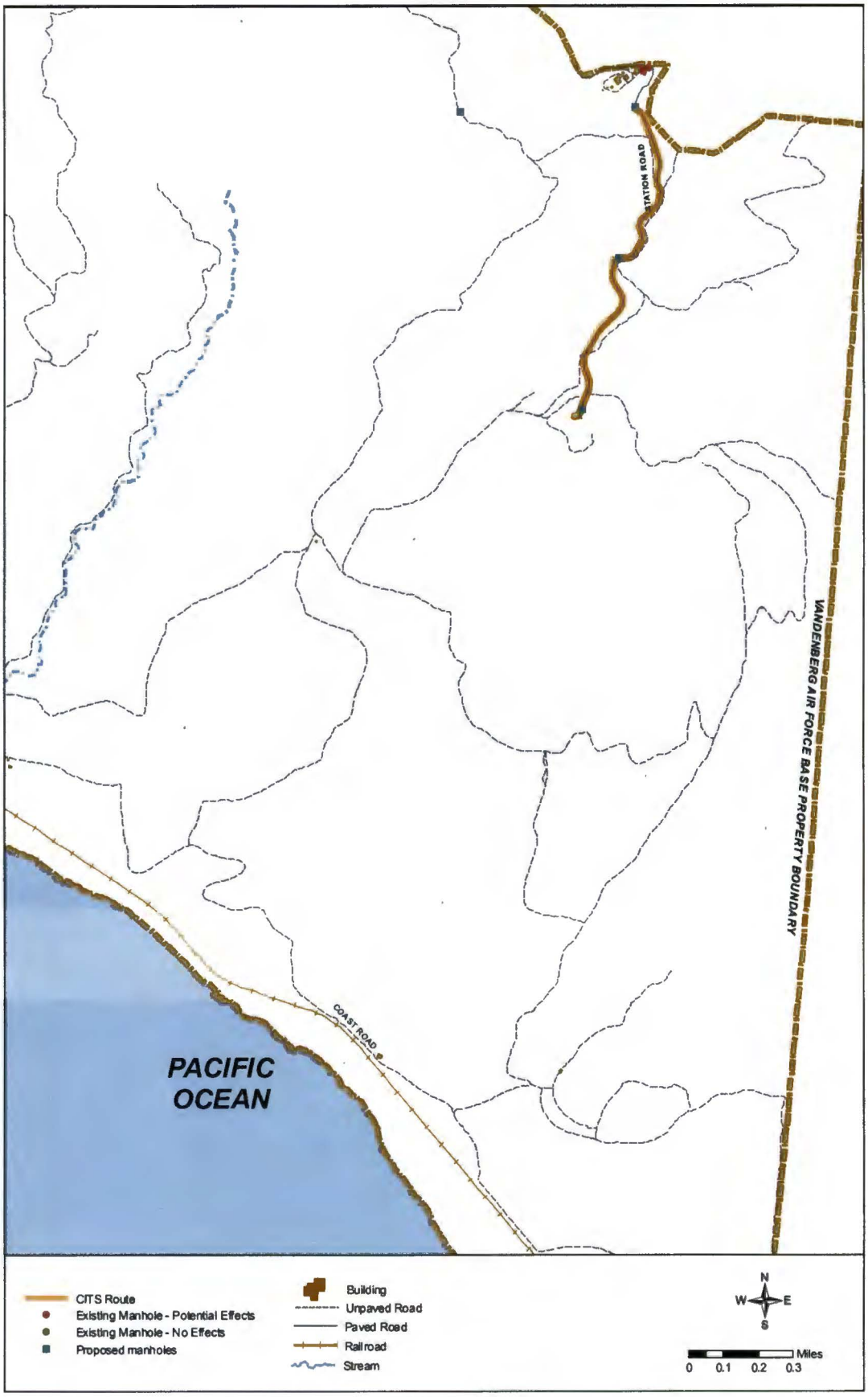

Figure A-14. Segment 12 of the proposed CITS route.

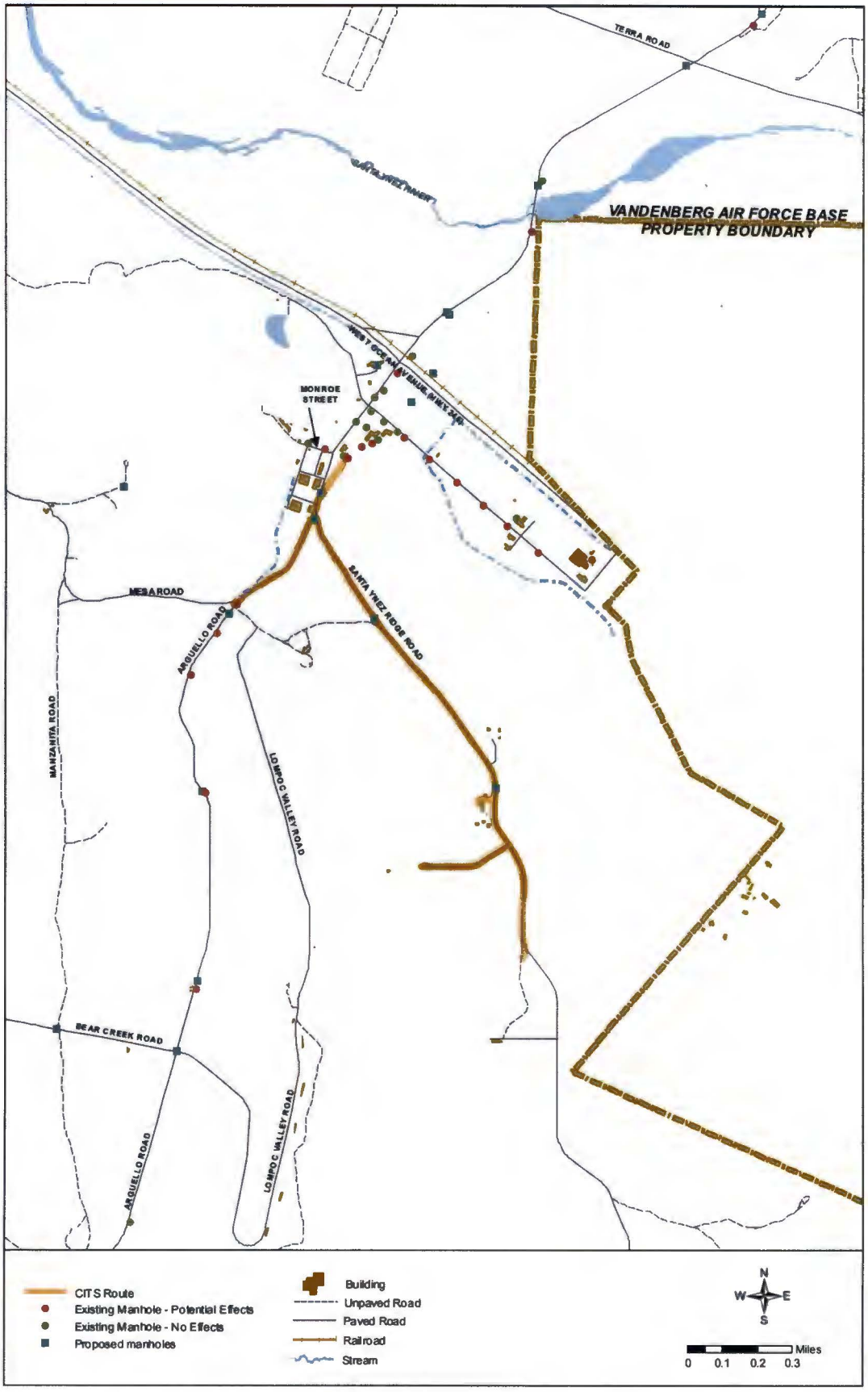

Figure A-15. Segment 13 of the proposed CITS route.

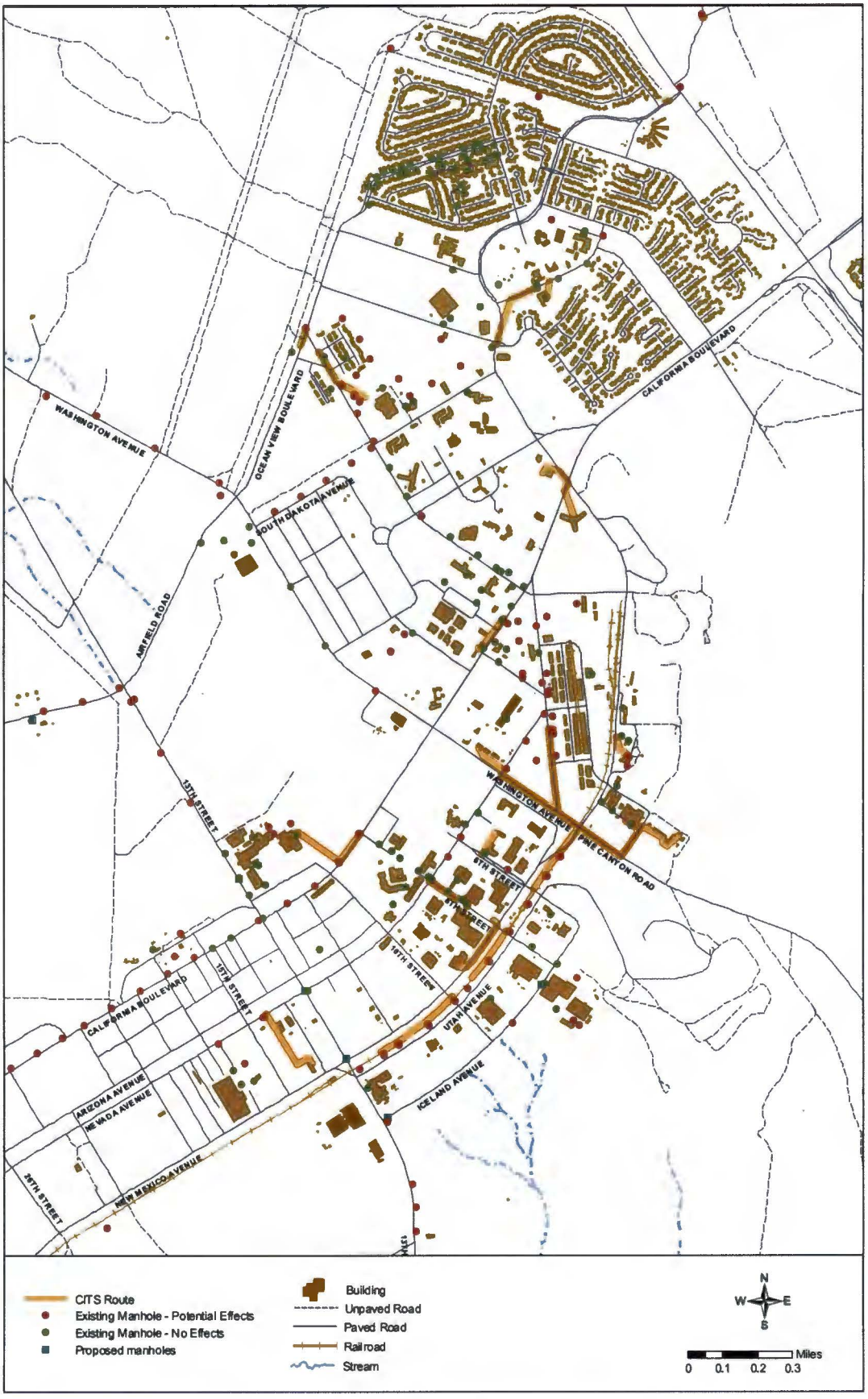

Figure A-16. Segment 14 of the proposed CITS route.

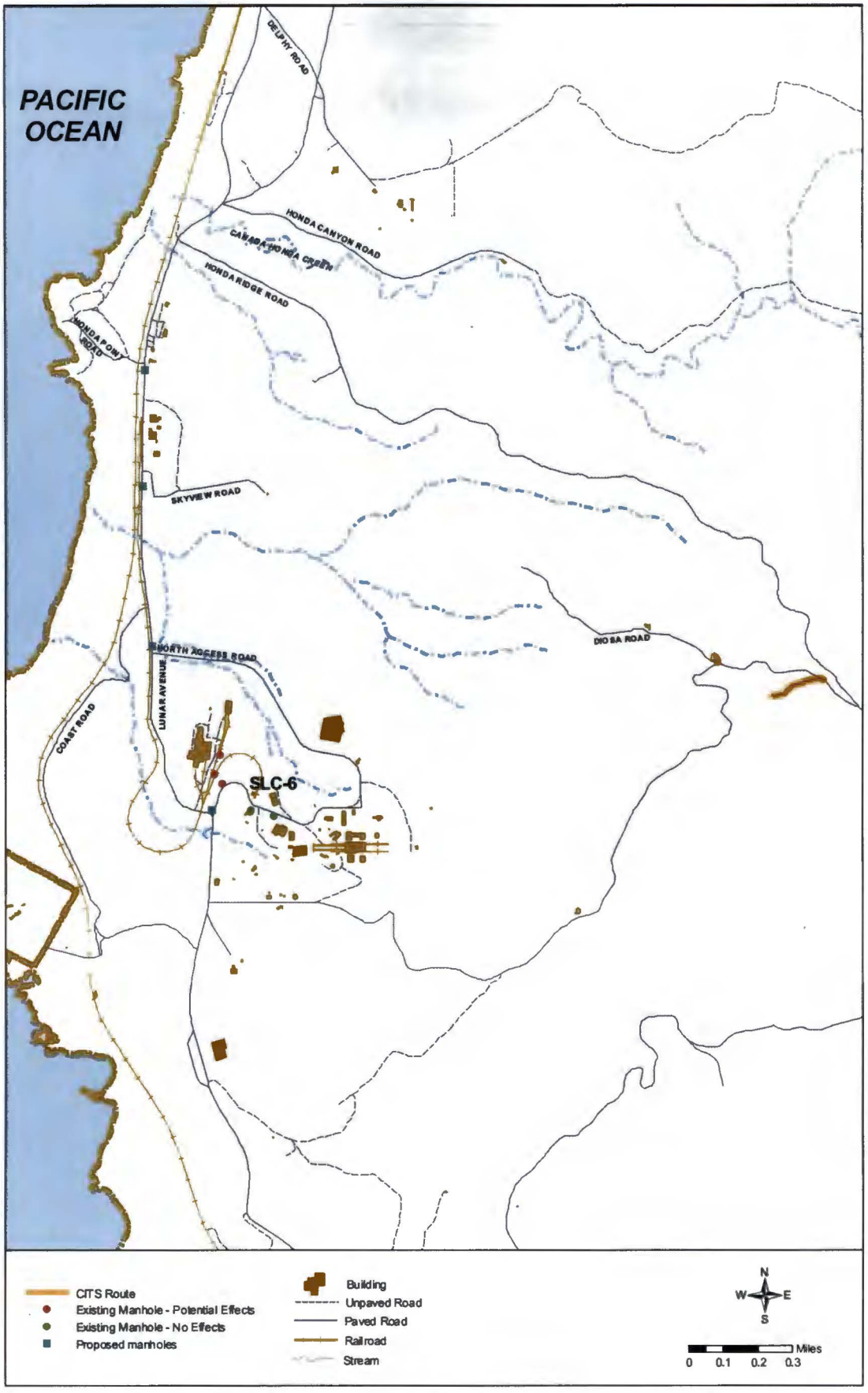

Figure A-17. Segment 15 of the proposed CITS route.

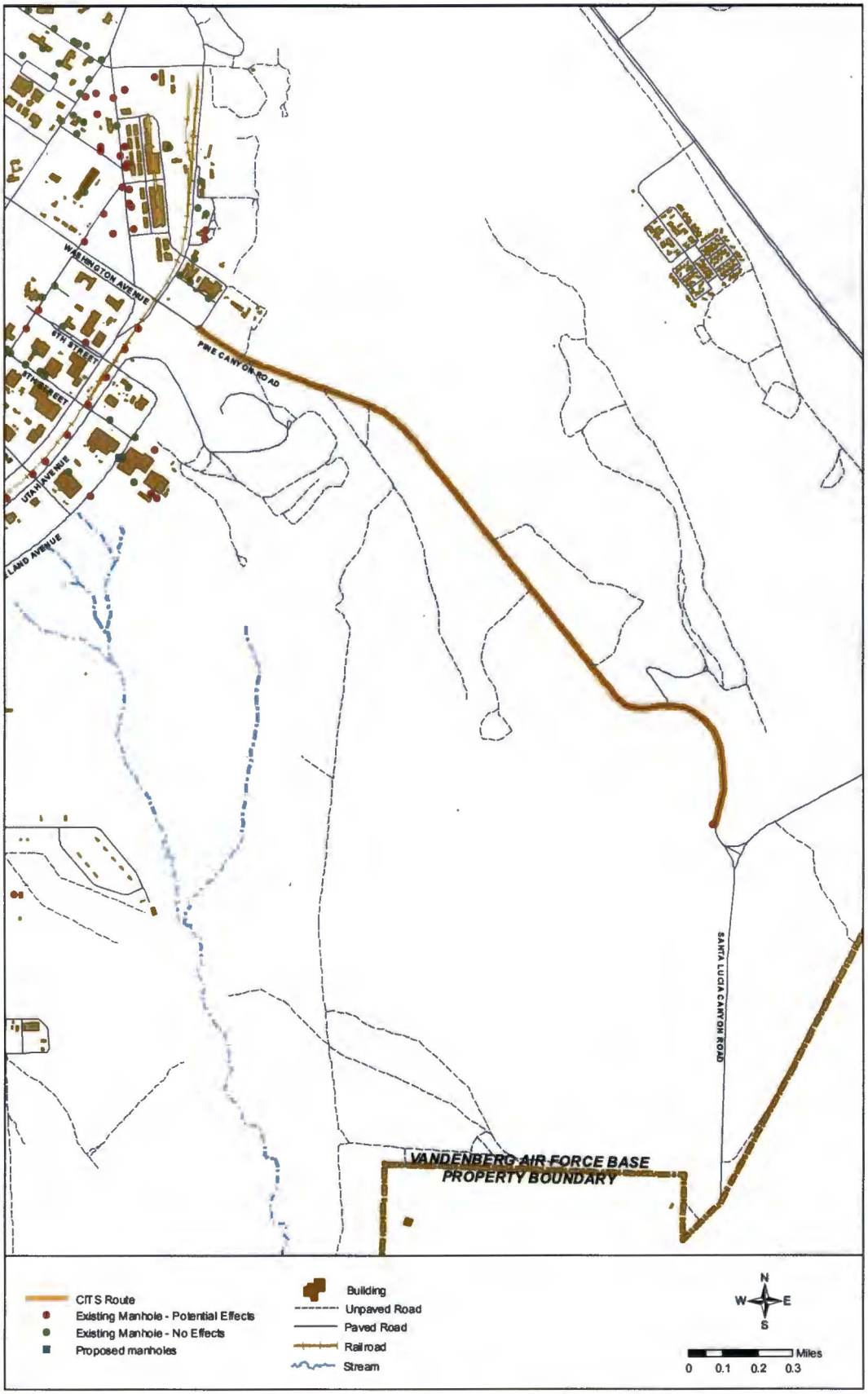

Figure A-18. Segment 16 of the proposed CITS route.

APPENDIX B

Biological Resources

Table B-1: Special status species and sensitive habitats along CITS Upgrade route.

Segment	Location	Status	Acreage of Suitable Habitat	Recommendation
1	Taft Rd and Point Sal Rd south for approximately 100 ft.	Gaviota tarplant present within one meter with suitable habitat on both sides of road.	Gaviota tarplant - 0.1 acre low quality habitat. - 1.7 acres of very low quality habitat in open space. Unlikely that Gaviota tarplant would occur.	Install on roadway.
2	Umbra Rd and Mod Rd.	Gaviota tarplant present within one meter with suitable habitat on both sides of road.	Gaviota tarplant - 0.3 acre low quality habitat.	Install on roadway.
3	El Rancho Oeste Rd to El Rancho Rd.	Gaviota tarplant suitable habitat on both sides of road	Gaviota tarplant - 1.3 acres low quality habitat.	Survey prior to construction.
4	Tangair Rd from Cross Rd to Red Rd (inclusive).	- Gaviota tarplant present within one meter with suitable habitat on both sides of road. - Vernal pools on west side of road. - Fairy shrimp present within several vernal pools with additional potential habitat through entire sector.	Gaviota tarplant - 3.5 acres low quality habitat. Vernal pool fairy shrimp - 0.65 acres of potential habitat.	Locate on roadway.
5	1) Washington Ave. 2) Airfield Rd west of 13th St.	1) Gaviota tarplant suitable habitat on both sides. 2) Gaviota tarplant suitable habitat on both sides.	Gaviota tarplant - 1.2 acres low quality habitat.	1) Survey prior to construction. 2) Survey prior to construction.
6	California Blvd west of 13th St.	- Gaviota tarplant present at various locations on both sides of road. - Gaviota tarplant suitable habitat on both sides of road. - Vernal pools on south side of road. - Vernal pool fairy shrimp present in pools on south side of road.	Gaviota tarplant - 3.1 acres low quality habitat.	1) Locate on roadway. 2) Strictly enforce the staging areas, as stated in the BO, with no parking on the south side of California Blvd.
7	1) New Mexico Ave east of 8th St. 2) Iceland Ave west of 10th St. 3) Iceland Ave east of 10th St. 4) 13th St south of RR tracks. 5) 13th St between California Blvd and Nevada Ave.	1) Gaviota tarplant present on both sides. 2) Gaviota tarplant on west side with suitable habitat on both sides. 3) Gaviota tarplant present on both sides. 4) Gaviota tarplant suitable habitat on both sides. 5) Gaviota tarplant suitable habitat on both sides.	Gaviota tarplant - 2.8 acres low quality habitat.	1) Locate on roadway. 2) Locate on roadway. 3) Locate on roadway. 4) Locate on roadway. 5) Survey for Gaviota tarplant prior to construction.

Segment	Location	Status	Acreage of Suitable Habitat	Recommendation
8	1) 13th St north of RR tracks. 2) 13th St south of RR tracks to Terra Rd 3) 13th St north of Ocean Ave in open space. 4) Open space route from Monroe St to Mesa Rd. 5) Bear Creek Rd and Manzanita Rd. 6) Bear Creek Rd and Napa Rd.	1) Gaviota tarplant suitable habitat on both sides. 2) Gaviota tarplant present on both sides and vernal pools and vernal pool fairy shrimp on both sides in northern 1 mile. 3) Gaviota tarplant suitable habitat. 4) Gaviota tarplant present through entire field. 5) Gaviota tarplant suitable habitat on both sides. 6) Survey for Gaviota tarplant prior to construction.	Gaviota tarplant - 7.5 acres low quality habitat. - 2.0 acres high quality habitat in open space.	1) Survey for Gaviota tarplant prior to construction. 2) Locate on roadway. 3) Survey for Gaviota tarplant prior to construction. 4) Install after seed has set and before the rainy season. Monitors will verify when the area has gone to seed. Plowing without vibration will be used to reduce impacts. The cable will be laid from the top of the hill working downslope as quickly as possible to reduce soil disturbance. No scraping will occur to prevent any erosion. No hydro-seeding will occur in this open space section. 5) Survey for Gaviota tarplant prior to construction. 6) Survey for Gaviota tarplant prior to construction.
9	1) Building 980 off Ordnance Rd. 2) Unpaved road between Wade St and Mesa Rd.	1) Gaviota tarplant present in close proximity. 2) Gaviota tarplant present on both sides of road.	Gaviota tarplant - 2.0 acres low quality habitat.	1) Locate on existing road/driveways. 2) Locate on existing unpaved road.
10	1) Napa Rd and Bear Creek Rd to Bldg 765. 2) 1700 ft south of Bear Creek Rd on Coast Rd. 3) Coast Road and Honda Ridge Rd. 4) Coast Rd from Bldg 541 to Skyview Rd. 5) Last 300 ft near entrance to SLC-6.	1) Gaviota tarplant suitable habitat. 2) Gaviota tarplant suitable habitat for approximately 600 ft. 3) Gaviota tarplant suitable habitat on both sides up to 200 ft north of intersection. 4) Gaviota tarplant suitable habitat on both sides. 5) Gaviota tarplant suitable habitat on both sides.	Gaviota tarplant - 2.1 acres low quality habitat.	1) Survey prior to construction. 2) Survey prior to construction. 3) Survey prior to construction. 4) Survey prior to construction. 5) Survey prior to construction.
11	1) Unpaved road along Bear Creek. 2) Junction of Bear Creek unpaved road and Arguello Rd.	1) Tarplant present along easternmost 5,000 ft. 2) Gaviota tarplant present.	Gaviota tarplant - 2.3 acres low quality habitat.	1) Locate on roadway. 2) Locate on roadway.
13	Santa Ynez Ridge Rd.	Gaviota tarplant suitable habitat on both sides of road.	Gaviota tarplant - 3.4 acres low quality habitat.	Survey prior to construction.

Segment	Location	Status	Acreage of Suitable Habitat	Recommendation
14	1) Washington Ave and New Mexico Ave. 2) Sector between Nevada Ave and Utah Ave (along railroad track). 3) Pine Canyon Rd and Iceland Ave.	1) Gaviota tarplant present during 2005 surveys. 2) Gaviota tarplant present during 2005 surveys. 3) Vernal pool present southeast of intersection.	Gaviota tarplant - 1.8 acres low quality habitat. Vernal pool fairy shrimp - 0.10 acre habitat.	1) Locate on roadway or east side of Washington Ave and north side of New Mexico Ave. 2) Survey for Gaviota tarplant prior to construction. 3) Install on roadway or on north side of Iceland Ave.
16	1) Pine Canyon Rd northern one mile 2) Pine Canyon Rd and Iceland Ave.	1) Gaviota tarplant present during 2005 survey, less extensive during 2006 survey. 2) Vernal pool present southeast of intersection.	Gaviota tarplant - 2.0 acres low quality habitat. Vernal pool fairy shrimp - 0.10 acre habitat.	1) Survey for Gaviota tarplant prior to construction. 2) Install on roadway or on southwest side of Pine Canyon Rd.

Table B-2: Special status species and sensitive habitats at existing and proposed manholes, handholes, and pullboxes of the CITS upgrade.

Identification	Resources	Recommendations
HANDHOLES		
EL HH 425 K	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use existing trail for staging and access.
HH 1	Tarplant mapped within 20 meters during 2005 surveys.	Access from Bldg 13730 parking lot.
HH 1026	Adjacent to drainage ditch; stay between handhole and building.	Access from Bldg 10260 parking lot.
HH 1028	- Located within a vernal pool.	- No work will occur within vernal pool when water is present. - Access to this pool will be from the roadway, with construction equipment staged on the road if feasible. If construction equipment needs to access the habitat, it will be staged on the iceplant. If further access is required, boards or plates will be used to distribute the weight of the equipment. - Construction equipment will have rubber tires (rather than tracked tires). - Qualified biological monitors will be onsite while access or construction occurs.
HH 1028 A	Vernal pool fairy shrimp pool to northeast.	Access from Bldg 1028 parking lot.
HH 1028 B	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from Bldg 1036 parking lot.
HH 1032 A	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use paved road for access and staging.
HH 1032 B	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use paved road for access and staging.
HH 11	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Bldg 1819 parking lot for access and staging.
HH 127 C1	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use paved road for access and staging.
HH 127 C2	Tarplant mapped within 20 meters during 2005 surveys.	Use roads for access and staging.
HH 127 C2	Tarplant mapped within 20 meters during 2005 surveys.	Use roads for access and staging.
HH 1577	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use May Rd for access.
HH 1578	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Bldg 1578 access road for access.

Identification	Resources	Recommendations
HH 1579	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use June Rd for access.
HH 1620 C	Isolated from known tarplant stands.	Use Summersill Ave for access and staging.
HH 1800 A	- Tarplant in adjacent surveyed area. - Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Umbra Rd for access and staging.
HH 1800 AB	- Tarplant in adjacent surveyed area. - Habitat not suitable for tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Umbra Rd for access and staging.
HH 1800 B	- Tarplant in adjacent surveyed area. - Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use existing trail off Umbra Rd for staging and access.
HH 1800 C	Tarplant mapped at manhole site and on access trail during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use south fork of existing trail off El Rancho Rd for access and staging.
HH 1800 D	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use El Rancho Rd for access and staging.
HH 1800 E	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use El Rancho Rd for access and staging.
HH 1800 F	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use 13th St for access and staging.
HH 1819 A	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use New South Rd for access and staging.
HH 1836 A	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Tod Rd for access and staging.
HH 189 BJ	Tarplant mapped within 30 meters of site during 2005 surveys.	Approach from south fork of existing trail.
HH 1937 AD	Located within tarplant stand.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Pt Sal Rd for access and staging (contain work area between handhole and road).
HH 1937 AE	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Colt Rd for access and staging.
HH 1950 1	Tarplant present in adjacent field.	Use El Rancho Rd for access and staging.
HH 1950 2	Tarplant present in adjacent field.	Use El Rancho Rd for access and staging.

Identification	Resources	Recommendations
HH 1963 1	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Soldado Rd for access and staging.
HH 1964	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Soldado Rd for access and staging.
HH 1971 B	Tarplant present in adjacent field.	Use trail southeast of Mina Rd for access and staging.
HH 1987 1	Tarplant present in adjacent field.	Use El Rancho Rd for access and staging.
HH 2 srs2	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Santa Barbara Ave for access and staging.
HH 222 EA	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - No existing access trail; access from Washington Ave.
HH 222 EB	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Washington Ave for access and staging.
HH 222 ED	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Washington Ave for access and staging.
HH 222 EE	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Washington Ave for access and staging.
HH 222 EG	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Washington Ave for access and staging.
HH 222 EH	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Washington Ave for access and staging.
HH 222 EJ	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use 13th St for access and staging.
HH 222 EK	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use 13th St for access and staging.
HH 222 EL	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use 13th St for access and staging.
HH 222 EM	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use 13th St for access and staging.

Identification	Resources	Recommendations
HH 222 EP	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use 13th St for access and staging.
HH 222 ES	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use 13th St for access and staging.
HH 234 AA	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use 13th St for access and staging.
HH 234 AB	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use 13th St for access and staging.
HH 234 AC 5	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use 13th St for access and staging.
HH 234 AF	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Airfield Rd for access and staging.
HH 235 EK	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from unpaved trail opposite Guam Ave.
HH 246 BP	- Suitable habitat for gaviota tarplant. - Tarplant mapped 250 meters south during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use 13th St for access and staging.
HH 247 DF	Tarplant mapped within 30 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Iceland Ave for access and staging.
HH 259 AD	- Vernal pool fairy shrimp 7 meters east. - Tarplant mapped within 50 meters during 2005 surveys.	- Survey for Gaviota tarplant during 2006 peak blooming period (June through September) prior to construction access. - Use 13th St for access and staging. - Flag or fence vernal pool fairy shrimp habitat.
HH 259 AE	- Vernal pool fairy shrimp 50 meters to north and south. - Tarplant mapped within 110 meters during 2005 surveys.	- Survey for Gaviota tarplant during 2006 peak blooming period (June through September) prior to construction access. - Use 13th St for access and staging.
HH 259 AF	Within tarplant stand.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use 13th St for access and staging.
HH 259 AG	- Vernal pool fairy shrimp 90 meters south. - Within tarplant stand.	- Survey for Gaviota tarplant during 2006 peak blooming period (June through September) prior to construction access. - Use 13th St for access and staging.
HH 259 AH	- Vernal pool fairy shrimp 20 meters southeast. - Within tarplant stand.	- Survey for Gaviota tarplant during 2006 peak blooming period (June through September) prior to construction access. - Use 13th St for access and staging.

Identification	Resources	Recommendations
HH 259 AI	- Vernal pool fairy shrimp 90 meters north. - Within tarplant stand.	- Survey for Gaviota tarplant during 2006 peak blooming period (June through September) prior to construction access. - Use 13th St for access and staging.
HH 259 AI 1	Tarplant mapped within 60 meters during 2005 surveys.	Use Bldg 6817 access road for access and staging.
HH 259 AM	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use 13th St for access and staging.
HH 289 AJ	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use 13th St for access and staging.
HH 289 AK	Within tarplant stand.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use 13th St for access and staging.
HH 300 D	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from Bldg 3000 parking lot.
HH 300 E	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from Bldg 3000 parking lot.
HH 389 FG	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Arguello Rd for access and staging.
HH 4 A	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use trail for access and staging
HH 425 L	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Honda Ridge Rd for access and staging.
HH 425 M	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Honda Ridge Rd for access and staging.
HH 425 N	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Honda Ridge Rd for access and staging.
HH 6	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from Bldg 3000 parking lot.
HH 907	Tarplant mapped within 40 meters during 2005 surveys.	Access from Mesa Rd north of Bldg 907; stay on perimeter.
HH C	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Patriot Rd for access and staging.

Identification	Resources	Recommendations
HH D	Located in field containing tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from Bldg 6419.
NL 001 (HH 1962)	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Soldado Rd for access and staging.
NL 010	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Arguello Rd for access and staging.
NL 011	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Arguello Rd for access and staging.
NL 012	Borders drainage with some surface flow.	- Use Clark St for access and staging. - Restrict activities between handhole and road. - Impliment BMPs.
PB 257B-F-1	Trail shoulder suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use trail off Mira Rd for access and staging.
UNK 004	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 115 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use parking lot for access and staging.
UNK 012	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from Alaska Way.
MANHOLES		
EL 55 (MH 1800 DA)	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use paved road for access and staging.
EL 555 (MH 418 B)	Tarplant mapped at manhole site and on access trail during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use existing trail for staging and access.
EL MH 197 E (MH 222)	Tarplant observed in adjacent habitat during other CITS surveys.	Use paved road for access and staging.
MH 104 D	Tarplant adjacent to site.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use trail for access and staging.
MH 104 E	Tarplant in adjacent clearing.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use trail for access and staging.

Identification	Resources	Recommendations
MH 104 F	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Richmond Rd for access and staging.
MH 104 K	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use San Antonio Rd West for access and staging.
MH 104 M	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Butt Rd for access and staging.
MH 115 A	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Briosa Rd and stay close to Bldg 1987 fence line.
MH 127 C	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - No established access trail; access from Orion Rd.
MH 127 K	Located in field containing tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use El Rancho Rd for access and staging.
MH 161 B	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Bldg 1801 for access and staging.
MH 185 A	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from Alden Rd.
MH 185 AA	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Napa Rd for access and staging.
MH 185 AD	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Bldg 935 parking lot for access.
MH 185 AE	Tarplant in vicinity and likely on unpaved trail.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use trail for access and staging.
MH 185 AF	- Tarplant in surrounding pasture and access trail. - Nesting birds possible in overgrown access trail.	- Survey for Gaviota tarplant during 2006 peak blooming period (June through September) prior to construction access. - Survey for nesting birds prior to access between March and August. - Access trail overgrown; may need clearing.
MH 189 BH	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access trail from Utah Rd.
MH 189 BP	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Corral Rd for access and staging.

Identification	Resources	Recommendations
MH 1950 3	Tarplant adjacent to site.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use El Rancho Rd for access and staging.
MH 196 AC	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 60 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Cross Rd for access and staging.
MH 196 AD	- Suitable habitat for Gaviota tarplant. - Tarplant observed in adjacent field.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Cross Rd for access and staging.
MH 196 AD	- Suitable habitat for Gaviota tarplant. - Tarplant observed in adjacent field.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Cross Rd for access and staging.
MH 210 CA	- Suitable habitat for Gaviota tarplant. - Nesting birds possible.	- Survey for Gaviota tarplant during 2006 peak blooming period (June through September) prior to construction access. - Survey for nesting birds prior to access between March and August. - Use Washington Ave for access and staging.
MH 211 CA	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Nebraska Ave for access and staging.
MH 211 CB	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 165 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Nebraska Ave for access and staging.
MH 211 CC	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 160 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Nebraska Ave for access and staging.
MH 211 EA	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 120 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Nebraska Ave for access and staging.
MH 211 EB	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 90 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from Bldg 13850.
MH 211 EC	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 160 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from Bldg 13825.
MH 211 ED	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 100 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from Bldg 13750.
MH 211 EE	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 100 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from Bldg 13700.
MH 220 A	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Tangair Rd for access and staging.

Identification	Resources	Recommendations
MH 221 B	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Airfield Rd for access.
MH 221 C	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Airfield Rd for access.
MH 221 D	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from Bldg F1746 parking lot.
MH 222 BA	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from South Dakota.
MH 222 BB	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from South Dakota.
MH 222 ET	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from 13th St.
MH 223 AF	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from Herado Ave.
MH 223 CB	- Suitable habitat for Gaviota tarplant. - Adjacent to vernal pool fairy shrimp pool.	- Survey for Gaviota tarplant during 2006 peak blooming period (June through September) prior to construction access. - Use 13th St for access and staging. - Restrict activities between manhole and road.
MH 232 A	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from gravel road to Bldg 1581.
MH 232 B	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from Bldg 1581.
MH 233 A	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Airfield Rd for access.
MH 233 B	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Airfield Rd for access.
MH 234 AC	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Airfield Rd for access and staging.
MH 234 AD	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Airfield Rd for access and staging.

Identification	Resources	Recommendations
MH 234 AE	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Airfield Rd for access and staging.
MH 235 BA	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use New Mexico Ave for access and staging.
MH 235 BB	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Nevada Ave for access and staging.
MH 235 BC	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Nevada Ave for access and staging.
MH 235 BE	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Herado Ave for access and staging.
MH 235 BF	- Suitable habitat for Gaviota tarplant. - Vernal pool fairy shrimp pool to east.	- Survey for Gaviota tarplant during 2006 peak blooming period (June through September) prior to construction access. - Access from New Mexico Ave. - Restrict activities between manhole and road.
MH 235 CC	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 100 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from California Blvd.
MH 235 CG	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Nevada Ave for access and staging.
MH 235 CJ	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use 6th St for access and staging.
MH 235 CK	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use adjacent parking lot or Nevada Ave for access and staging.
MH 235 DD	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 50 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Follow RR tracks.
MH 235 EA	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 100 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from California Blvd.
MH 235 ED	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 100 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from Bldg 10600.
MH 235 EE	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from Herado Ave.

Identification	Resources	Recommendations
MH 235 EG	- Suitable habitat for Gaviota tarplant. - Vernal pool fairy shrimp pool adjacent to manhole.	- Survey for Gaviota tarplant during 2006 peak blooming period (June through September) prior to construction access. - Access from New Mexico Ave. - Restrict activities between manhole and road. - Flag or fence vernal pool fairy shrimp habitat. -Monitors to be onsite during manhole access or work.
MH 235 EH	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from New Mexico Ave.
MH 235 EJ	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 100 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from New Mexico Ave.
MH 246 BA	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use California Blvd for access and staging.
MH 246 BB	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use California Blvd for access and staging.
MH 246 BE	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 15 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use California Blvd and sidewalk for access and staging.
MH 246 CA	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 105 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use California Blvd for access.
MH 246 CB	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 250 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use California Blvd for access and staging.
MH 246 CC	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 35 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use California Blvd for access and staging.
MH 246 CD	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 90 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use California Blvd for access and staging.
MH 246 CE	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 60 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use California Blvd for access and staging.
MH 246 DA	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 20 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use California Blvd and sidewalk for access and staging.
MH 246 DB	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 120 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use California Blvd for access.

Identification	Resources	Recommendations
MH 246 DD	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 35 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Nevada Ave for access and staging.
MH 246 DE	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 150 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Nevada Ave for access and staging.
MH 247 AA	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use California Blvd for access and staging.
MH 247 AM	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 20 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from Utah Ave along RR tracks.
MH 247 BA	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 115 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from Utah Ave along RR tracks.
MH 247 BB	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 15 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from 6th St along RR tracks.
MH 247 BC	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 30 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from 6th St along RR tracks.
MH 247 BF	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 55 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from Bldg 8500 parking lot.
MH 247 CB	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 5 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from 13th St along RR tracks.
MH 247 CC	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 15 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from Utah Ave.
MH 247 CD	- Manhole within tarplant stand mapped during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from Utah Ave.
MH 247 CE	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 25 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from Utah Ave.
MH 247 CF	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 40 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use 10th St for access and staging.
MH 247 CG	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 30 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from Utah Ave.

Identification	Resources	Recommendations
MH 247 DC	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 150 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from Bldg 8510 perimeter trail.
MH 247 DD	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 150 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from Bldg 8510 perimeter trail.
MH 257 AA	Trail shoulder suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use trail for access and staging.
MH 257 AB	Trail shoulder suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use trail for access and staging.
MH 257 AC	Tarplant present in vicinity.	Access from Bldg 1560 parking lot.
MH 257 AD	- Access trail with tarplant. - Vernal pool fairy shrimp pool 30 meters south. - Possible nesting birds in overgrown trail.	- Survey for Gaviota tarplant during 2006 peak blooming period (June through September) prior to construction access. - Survey for nesting birds prior to access between March and August. - Existing trail head at Tonto Rd and Bldg 1560 security access trail.
MH 257 BA	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 50 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use California Blvd for access.
MH 257 BB	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 40 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use California Blvd for access.
MH 257 BC	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 180 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use California Blvd for access and staging.
MH 257 BE	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from Bldg 3000 parking lot.
MH 257 BF	Trail shoulder suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use trail for access and staging.
MH 257 DB	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use California Blvd for access and staging.
MH 257 DC	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use California Blvd for access.
MH 257 DD	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 65 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use California Blvd for access and staging.

Identification	Resources	Recommendations
MH 258 AA	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 90 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use California Blvd for access and staging.
MH 258 CA	- Suitable habitat for Gaviota tarplant. - Vernal pool fairy shrimp pools in access trail. - Possible nesting birds in trail.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Survey for nesting birds prior to access between March and August. - Use Alabama Ave for access; turn right 60 meters past RR tracks and parallel tracks. - Fence vernal pool fairy shrimp habitat for exclusion.
MH 259 AC	- Tarplant present in vicinity. - Vernal pool fairy shrimp poll 18 meters east.	- Survey for Gaviota tarplant during 2006 peak blooming period (June through September) prior to construction access. - Use Iceland Ave for access and staging. - Restrict activities between manhole and road. - Flag or fence vernal pool fairy shrimp habitat.
MH 269 BA	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 100 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use California Blvd for access and staging.
MH 317 DB	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Monroe St for access and staging.
MH 318 AE	Located near drainage.	- Use Clark St for access and staging. - Restrict activities between manhole and road.
MH 330 B	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Bldg 836 parking to access.
MH 351 CC	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from Bldg 730.
MH 352 BB	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Napa Rd for access and staging.
MH 389 AA	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Arguello Rd for access and staging.
MH 389 DH	Possible nesting birds in overgrown access.	- Survey for nesting birds prior to access between March and August. - Access from Arguello Rd.
MH 389 FB	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Arguello Rd for access and staging.
MH 389 FC	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Arguello Rd for access and staging.

Identification	Resources	Recommendations
MH 389 FE	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Arguello Rd for access and staging.
MH 389 FF	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Arguello Rd for access and staging.
MH 422 D	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 15 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use paved road for access and staging.
MH 422 E	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 35 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from Bldg 398.
MH 422 F	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 45 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from Bldg 398.
MH 53 CA	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Bldg 1974 parking lot for access and staging.
MH 53 CB	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Bldg 1974 parking lot for access and staging.
MH 53 CC	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Globe Rd for access and staging.
MH 53 CD	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Globe Rd for access.
MH 53 CD	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use Globe Rd for access.
MH 725 C	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from northeast of Bldg 7025.
MH 725 D	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from northeast of Bldg 7025.
NEW MH 14	Within tarplant stand.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from New Mexico Ave.
NEW WROCC MH	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from northeast of Bldg 7025.

Identification	Resources	Recommendations
NL 003 (MH 75 B)	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use roads for access and staging.
NL 004 (MH 75 A)	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use roads for access and staging.
NMH 11	- Suitable habitat for Gaviota tarplant. - Vernal pool fairy shrimp pool to east.	- Survey for Gaviota tarplant during 2006 peak blooming period (June through September) prior to construction access. - Access from New Mexico Ave. - Restrict activities between manhole and road.
NMH 16	Within tarplant stand.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from Nebraska Ave.
UNK 034	- Tarplant adjacent to site. - Possible nesting birds in brush on access route.	- Survey for Gaviota tarplant during 2006 peak blooming period (June through September) prior to construction access. - Survey for nesting birds prior to access between March and August. - Access from Plato Rd.
UNK 048	Suitable habitat for Gaviota tarplant.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Access from New Mexico Ave.
PULLBOXES		
PB 138 C	- Suitable habitat for Gaviota tarplant. - Tarplant mapped within 5 meters during 2005 surveys.	- Survey during 2006 peak blooming period (June through September) prior to construction access. - Use existing access trail.

APPENDIX C

Cultural Resources

Appendix C – Cultural Resources

The following synthesis, modified from Lebow and Moratto (2001), provides a general overview of the prehistory and ethnohistory of the Vandenberg AFB region (i.e., Santa Barbara and San Luis Obispo counties). The historical synthesis, primarily derived from Palmer (1999), is more specific to Vandenberg AFB.

Prehistory

The prehistory of California's central coast spans the entire Holocene and may extend back to late Pleistocene times. In the Santa Barbara Channel region, a fluted Clovis point found on the surface of a coastal site suggests use of the area possibly as early as 11,000–12,000 years ago (Erlandson et al. 1987), while a site on San Miguel Island has yielded a radiocarbon date of 10,300 B.P. (Erlandson 1991). Recent calibrations suggest that terminal Pleistocene radiocarbon dates are about 2,000 years too recent (Fiedel 1999:95) and thus these early sites may be even older.

In San Luis Obispo County, excavations at CA-SLO-2 in Diablo Canyon revealed an occupation older than 9,000 years (Greenwood 1972; Moratto 1984) and investigations at CA-SLO-1797 indicate initial occupations as early as 10,300 B.P. (Fitzgerald 2000). Occupations on Vandenberg AFB occurred by at least 8,500–9,000 years ago, based on radiocarbon dates from CA-SBA-246 (Lebow et al. 2001) and CA-SBA-931 (Glassow 1990, 1996) both located near the mouth of the Santa Ynez River.

Moratto (1984) refers to these early occupations as Paleocoastal. Population densities were probably low, judging from the limited number of sites dated to this period. Diagnostic tools associated with this time period have not been identified, although similarities with the San Dieguito Complex in southern California (Wallace 1978; Warren 1967) have been suggested (Erlandson 1994). Cultural assemblages have few of the grinding implements common to subsequent periods. These sites are characterized by a strong maritime orientation and an apparent reliance on shellfish. Occupants are thought to have lived in small groups that had a relatively egalitarian social organization and a forager-type land-use strategy (Erlandson 1994; Glassow 1996; Greenwood 1972; Moratto 1984).

Site densities throughout the Central Coast are higher during the subsequent periods, suggesting increased population size and possibly better site preservation. Sites dating between about 8,000 and 6,500 years ago often have relatively high densities of manos and milling slabs that are typically associated with processing seeds. These milling stones are diagnostic of this period. Early scholars associated sites of this age with inland knolls and terraces (e.g., Rogers 1929), but subsequent investigations revealed that coastal environments were also used (e.g., Glassow et al. 1988). Well-developed middens at many sites suggest a more sedentary and stable settlement system (Breschini et al. 1983). Glassow (1990, 1996) infers that occupants of Vandenberg AFB during this time were sedentary and had begun using a collector-type (i.e., logistically mobile) land-use strategy. Burial practices suggest that society was primarily egalitarian (Glassow 1996).

Diet appears to have been diverse during the period between 8000 and 6500 B.P. High frequencies of milling stones suggest that seeds were important (Glassow 1996; Glassow et al. 1988), although shellfish appear to have continued as a dietary staple throughout the Central Coast (Erlandson 1994; Glassow et al. 1988), including Vandenberg AFB (Glassow 1996; Woodman, Cagle, de Barros et al. 1995). However, terrestrial mammals composed a larger portion of the diet on Vandenberg AFB during this period than during any other time (Glassow 1996; Rudolph 1991). Fish were a larger part of the diet than shellfish at Morro Bay in San Luis Obispo County, although shellfish were better represented during this period than during subsequent periods (Jones et al. 1994).

Population densities appear to have decreased substantially between 6500 and 5000 B.P. throughout the region, and little is known about this period. It is possible that arid conditions associated with the Altithermal degraded the environment to the point that only low population densities were possible (Glassow 1996; Glassow et al. 1988).

After 5000 B.P., population densities increased to pre-6500 B.P. levels as conditions became cooler and more moist. Between 5000 and 3000 B.P., mortars and pestles became increasingly common throughout the region, suggesting intensified use of acorns (Basgall 1987; Glassow et al. 1988), although these implements may have been associated with processing pulpy roots or tubers (Glassow 1997). Along the Santa Barbara Channel coastline, use of shellfish declined as other animal foods became more important. Use of more diverse environmental settings is suggested (Erlandson 1997). On Vandenberg AFB, fish and sea mammals composed a larger part of the diet during this period. Large side-notched and stemmed projectile points became more prevalent in the archaeological record, presumably reflecting increased hunting, although Glassow (1996) suggests that proportions of terrestrial mammals do not surpass the pre-6500 B.P. levels. However, higher proportions of terrestrial mammals in archaeological assemblages are associated with this period in San Luis Obispo County. Increased logistical organization is suggested in this area (Jones et al. 1994; Jones and Waugh 1995). Proportions of obsidian (indicating exchange with other regions) increased after about 5000 B.P., particularly in San Luis Obispo County (Jones et al. 1993, 1994; Jones and Waugh 1995).

Cultural complexity appears to have increased around 3,000–2,500 B.P. Based on mortuary data from the Santa Barbara area, C. King (1981, 1990) suggests a substantial change in social organization and political complexity about 3,000 years ago. According to King, high-status positions became hereditary and individuals began to accumulate wealth and control exchange systems. Arnold (1991, 1992) proposes that this evolutionary step in socioeconomic complexity occurred around 700–800 years ago.

The period between 2,500 and 800 years ago is marked by increased cultural complexity and technological innovation. Fishing and sea mammal hunting became increasingly important, corresponding to development of the *tomol* (a plank canoe), single-piece shell fishhooks, and harpoons (Glassow 1996; King 1990). The bow and arrow also was introduced during this period (Glenn 1990, 1991). Sites in San Luis Obispo County suggest that use of terrestrial mammals remained high. Proportions of imported obsidian continued to increase during this period (Jones et al. 1993).

Arnold (1992) proposes that the complex Chumash sociopolitical system known at historic contact evolved substantially during a brief period between A.D. 1150 and 1300, which she terms the Middle-Late Transitional Period. Arnold infers that decreased marine productivity caused by elevated sea-surface temperatures resulted in subsistence stress that allowed an elite population to control critical resources, labor, and key technologies, resulting in hierarchical social organization and a monetary system. Although the issue of elevated sea-surface temperatures has been questioned (e.g., Kennett 1998) and the inference of marine degradation and subsistence stress has been challenged (e.g., Raab et al. 1995; Raab and Larson 1997), the full emergence of Chumash cultural complexity around this time is generally accepted.

On Vandenberg AFB and in the Santa Barbara Channel region, population densities reached peak levels between 700 years ago and historic contact (Glassow 1990, 1996). Higher numbers of *Olivella* shell beads reflect increased exchange between the Channel Islands, the Santa Barbara mainland, and Vandenberg AFB. Increased subsistence diversity is apparent. Although shellfish continued to be a dietary staple in the Vandenberg area, the use of fish and birds increased, proportions of secondary species in shellfish assemblages increased (Glassow 1990), and dietary expansion is evident (Lebow and Harro 1998). Correspondingly, the range and diversity of site types increased as a greater range of habitats and resources was used (Glassow 1990; Lebow and Harro 1998; Woodman et al. 1991). In San Luis Obispo County, the settlement system appears to have changed substantially after 700 B.P. as residential bases along the coast were abandoned in favor of habitation sites farther inland. Coastal sites were used to obtain resources during short-term occupations (Breschini and Haversat 1988; Greenwood 1972; Jones et al. 1994; Jones and Waugh 1995). In addition, proportions of imported obsidian decreased substantially during this period (Jones et al. 1994).

Ethnohistory

People living in the Vandenberg AFB area prior to historic contact are grouped with the Purisimeño Chumash (Greenwood 1978; King 1984; Landberg 1965), one of several linguistically related members of the Chumash culture. Their social organization, traditions, cosmology, and material culture are described by Blackburn (1975), Grant (1978a, 1978b, 1978c, 1978d), Greenwood (1978), Hudson et al. (1977), Hudson and Blackburn (1982, 1985, 1986), Hudson and Underhay (1978), Johnson (1988), and Landberg (1965).

Available historical accounts and translations of early explorers' observations in the Santa Barbara Channel area indicate that the Chumash people lived in large, densely populated villages with well-built structures (e.g., Bolton 1926, 1931; Engelhardt 1933; Fages 1937; Moriarity and Keistman 1968; Simpson 1939; Teggart 1911; Wagner 1929). With a total Chumash-speaking population estimated at 18,500 (Cook 1976) and employing a maritime economy, the Chumash had a culture that "was as elaborate as that of any hunter-gatherer society on earth" (Moratto 1984:118). Leadership was hereditary and chiefs exercised control over more than one village, reflecting a simple chiefdom social organization. The Chumash engaged in craft specialization and maintained exchange systems (Arnold 1992; Johnson 1988).

Relatively little is known about the Chumash in the Vandenberg region. Explorers noted that villages were smaller and lacked the formal structure found in the Channel area (Greenwood 1978:520). Approximately 22 villages were used by the Purisimeño Chumash at historic contact, with populations between 30 and 200 per village (Glassow 1996:13–14). About five ethnohistoric villages are identified by King (1984:Figure 1) on Vandenberg AFB, along with another five villages in the general vicinity.

Unfortunately, early explorers paid scant attention to Chumash subsistence and settlement systems. Using ethnohistoric, ethnographic, and archaeological data, Landberg (1965) attempted to reconstruct those facets of Chumash lifeways. Chumash subsistence relied primarily on fishing, hunting, and gathering plants (primarily acorns). In the spring, groups left their winter villages for temporary camps where they gathered grasses, roots, tubers, and bulbs. Hunting marine mammals became important during times when seals and sea lions congregated at their rookeries. Bulbs, roots, and tubers also were gathered during the summer months as well, and seeds became important during this season, especially to the people north of Point Concepción. Interior groups moved to the coast during the spring and summer to collect shellfish. Coastal groups returned to their villages in late summer and early fall to harvest large schooling fish such as tuna. Pine nuts were collected in the mountains during the fall months; acorns also were gathered in the late fall. Both of these resources, as well as berries collected during the late summer and early fall, were stored for use during the winter. Hunting also was important during the fall. Winter months were spent in villages, where residents relied primarily on stored foodstuffs as well as occasional fresh fish (Landberg 1965:102–104). Regional variation in subsistence strategies is evident in the ethnohistoric record (Landberg 1965:104–118); in the interior and along the northern coast of Chumash territory, marine resources were less important than acorns, seeds, and game (particularly deer).

Contact with early Euro-American explorers, beginning with the maritime voyages of Cabrillo in A.D. 1542–1543, undoubtedly had an effect on the Chumash culture. The effect may have been profound. Erlandson and Bartoy (1995, 1996) and Preston (1996) convincingly argue that Old World diseases substantially impacted Chumash populations more than 200 years before Spanish occupation began in 1769. Therefore, population estimates based on later Spanish observations and mission records may be much lower than actual populations at the time of initial Spanish contact.

Unquestionably, drastic changes to Chumash lifeways resulted from the Spanish occupation that began with the Portolá expedition in A.D. 1769. The first mission in Chumash territory was established in San Luis Obispo in 1772, followed in short order by San Buenaventura (1782), Santa Barbara (1786), and La Purísima Concepción, established in 1787 in the present location of Lompoc. The Santa Ynez mission was established in 1804. Eventually, nearly the entire Chumash population was under the mission system. During the 1830s, the missions were secularized in an attempt to turn the mission centers into pueblos and make the Indians into Mexican citizens (Grant 1978a).

History

Vandenberg AFB history is divided into the Mission, Rancho, Anglo-Mexican, Americanization, Regional Culture, and Suburban periods (Palmer 1999). The Mission Period began with the early Spanish explorers and continued until 1820. Poor sailing conditions along California's coastline prompted the Spanish to find overland routes for colonization. In August and September of 1769, Captain Gaspar de Portolá led an expedition that crossed through the Vandenberg AFB area on its way to establish a mission at Monterey. A diary of the expedition was kept by Fray Juan Crespi. Reconstruction of the expedition route suggests that they camped at several locations in the Vandenberg region, including Jalama Beach, the ethnohistoric Chumash village of *Nocto* near Point Pedernales, the mouth of the Santa Ynez River, and a temporary Chumash encampment adjacent to a large pond just north of San Antonio Creek (Bradley 1994:16; Roberts 1984:11-2–11-3).

In 1776, Juan Bautista de Anza led an expedition of settlers to establish San Francisco, following the route used by Portolá through the Vandenberg AFB region. Fray Pedro Font kept a detailed diary of the journey (Bolton 1931), indicating that the expedition camped near Jalama Beach on February 27, and near the mouth of the Santa Ynez River the next day. On February 29, they crossed the river and traveled northeast for four leagues (approximately 10 miles), camping at the same pond where Portolá had camped in 1769 (Bradley 1994:17; Roberts 1984:11-5).

The Mission Period continued until 1820. Established in 1787, Mission la Purísima Concepción encompassed the area between Gaviota and Guadalupe. Farming and ranching were the primary economic activities at the Mission, which was responsible for supplying the Santa Barbara Presidio with food supplies. The Mission had 4,000 head of sheep by 1800; by 1812 they numbered 12,000 and by 1821 the count peaked at 23,546. Missionaries had the Chumash weave wool blankets for the Santa Barbara Presidio. Approximately 14,000 sheep remained when the Mission closed in 1835. In addition to sheep, wheat, barley, corn, peas, and beans were grown at Mission La Purísima. Agricultural activities primarily occurred along the major streams such as San Antonio Creek and the Santa Ynez River (Palmer 1999:2).

The Rancho Period of Vandenberg AFB history began in 1820 and continued until 1845 (Palmer 1999). Following secularization in 1834, the Alta California government granted former mission lands to Mexican citizens as ranchos. Project locations on North Vandenberg AFB lie within Rancho Jesus Maria, which originally encompassed 42,184 acres and was granted to Lucas, Antonio, and Jose Olivera in 1837. By 1839, Antonio and Jose Olivera had sold their part of the land grant to Jose Valenzuela, who, in 1847, sold a one-third share to Don Pedro Carrillo and a one-third share to Lewis T. Burton. Project locations on South Vandenberg AFB are within Rancho Lompoc, which was granted to Joaquin and José Carrillo in 1837 and originally encompassed 42,085 acres. Little improvement was made to the rancho except for an isolated adobe in the extreme northeast corner of the land grant. Cattle ranching was the primary economic activity during the Rancho Era; in the 1840s cattle were so abundant that only the hides had any value. The Carrillos raised cattle on Rancho Lompoc, which were sold to miners in the north. Fishing and trapping became important economic activities during this period (Palmer 1999:7–13).

The Bear Flag Revolt and the Mexican War marked the beginning of the Anglo-Mexican Period (1845–1880). Cattle ranching continued to flourish during the early part of this period, with as many as 500,000 cattle in Santa Barbara County during the 1850s. However, severe droughts during the 1860s decimated cattle herds and less than 5,000 cattle remained in the entire county. The combination of drought and change in government from Mexican to the United States caused substantial changes in land ownership. By 1851, approximately 42 percent of the land grants were owned by non-Mexicans; by 1864, after a few years of drought, 90 percent of the southern California ranchos were mortgaged. The various shares in Rancho Jesus Maria changed hands, with Lewis Burton increasing his holdings. His son, Ben Burton, inherited all of Rancho Jesus Maria upon the death of Burton in 1879. Tax problems forced the Carrillos to sell Rancho Lompoc to Thomas More in 1859, who sold the land 4 years later to a consortium of William Hollister, Thomas Dibblee, and Joseph Cooper. This group was largely responsible for returning ranching to the area after the drought years by importing sheep, which required less water and forage than cattle and thus were better able to survive the dry years. However, the consortium dissolved in 1873 and the rancho was subdivided. Sheep ranching and grain farming replaced the old rancho system during this period. Dairy farming became an important economic activity, particularly as Swiss-Italians immigrated into the area. Early roads were

established during the 1860s and 1870s to obtain supplies that were surfed in at Point Sal. Farming remained a limited activity, due in part to the difficulty of shipping to markets. Lompoc was established during this period by the Lompoc Temperance Colony (Palmer 1999).

Increased population densities characterize the Americanization Period (1880–1915). The railroad reached the area in the late 1890s, and providing a more efficient means of shipping and receiving goods and supplies, which in turn increased economic activity. Ranching continued and agriculture increased, particularly with development of steam-powered threshers. Row crops became increasingly common, and sugar beets were one of the most economically important crops. Dairy farming also increased, particularly on South Vandenberg AFB, and the population of the Italian-Swiss ethnic community continued to grow. The former Rancho Lompoc was further subdivided for ranches, dairies, and farms in the Bear Creek, Surf, and La Salle Canyon areas. Oil exploration began in earnest during this period. Union Oil began to purchase Rancho Jesus Maria property in 1903; they ultimately obtained subsurface rights to 120,000 acres in the area. Ben Burton leased the former Rancho Jesus Maria for grazing and farming during the early part of the Americanization Period. However, by 1900 the rancho was divided into four parcels and sold. These four parcels were further subdivided by 1906. Edwin Marshall formed the Jesus Maria Rancho Corporation in December of 1906; by the 1920s the Marshall Ranch encompassed 52,000 acres and prospered by raising cattle and beets (Palmer 1999).

Agriculture continued to dominate the economy during the Period of Regional Culture (1915–1945). As many as 150 dairies operated in the area during this period, although the number of dairies decreased as farmland became more profitable for row crops and the dairy industry switched from an emphasis on butter and cream to milk. Peas and beans were important crops in the area. Migrant workers were attracted to the area, and a camp was established in the Bear Creek vicinity. Surf became a popular recreation destination; in 1933, nearly 12,600 people visited Ocean Park. Crude homes were constructed at the park, and many Lompoc residences would spend their summers at Surf. During World War II, the Salvation Army opened a USO club at Surf, which entertained approximately 30,000 troops per month. Ranching and farming continued on the Marshall Ranch during the early part of the Period of Regional Culture. In 1935, it converted to a dude ranch operation known as Marshallia Ranch, catering to Hollywood personalities. The ranch was sold to Frank Long upon the death of Edwin Marshall in 1937. Cattle ranching and guest operations continued until the start of World War II, when the property was condemned for Camp Cooke. All ranching, farming, and dairy farming in the Vandenberg AFB area was substantially reduced when Camp Cooke was established in 1941. This army training facility was built on approximately 90,000 acres along the coast, and included the area of Rancho Jesus Maria. Camp Cooke was deactivated at the end of World War II (Palmer 1999).

The Suburban Period (1945–1965) began with the end of World War II. After Camp Cooke was deactivated, the Army continued the historic tradition and leased much of the area for ranching and farming. Oil drilling reached its peak during this period. Most of the Suburban Period is characterized by military use of the area. Camp Cooke was reactivated in 1950 for training during the Korean War. It was put into caretaker status from 1953 to 1956. The Cantonment area became so overgrown that sheep were used to manage the vegetation and reduce the fire hazard. In November of 1956, the army transferred 64,000 acres of North Camp Cooke to the Air Force, and it was renamed the Cooke Air Force Base (Palmer 1999). In 1958 the base had its first missile launch, the Thor, and was renamed Vandenberg AFB. The southern section of the current base was transferred to the Air Force from Army and Navy control in 1964 (Vandenberg AFB 1992). Post-transfer use of both North and South Vandenberg AFB has related primarily to the construction and operation of missile launch and support facilities. Specific activities include management of the launch, testing, and evaluation of ballistic missile and space systems for the DOD, and operation of the Western Range (Science Applications International Corporation [SAIC] 1995; Vandenberg AFB 1992).

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APPENDIX D

Air Quality Analysis

Appendix D – Air Quality Analysis

Construction data obtained from Cannon Construction Inc. were used to prepare this analysis. The procedures and equations used to calculate the air emissions are detailed below.

Technical Assumptions and Emission Calculation

Proposed Action

The Proposed Action would install 468,520 feet (ft) (or 89.7 miles) of new/replacement conduit/cable, along 259,520 ft (49.2 miles) of trenching, as well as 82 new manholes, handholes, and pullboxes, and maintenance and upgrade work at 438 existing manholes, handholes, and pullboxes. Installation of cabling and augmentation of existing cabling would occur over approximately a 12-month period. Depending on the geology and topography, the following methods would be used: trenching with a backhoe, trenching with a rock wheel, direct burial by plowing, and horizontal directional drilling (HDD).

The equipment used for the reasonable worst-case scenario daily and the total project are presented in Table D-1. Table D-2 shows the emissions factors used to estimate the emissions, while Tables D-3 and D-4 show the reasonable worst-case daily and total project emissions.

Sources of air emissions from the proposed action would include combustive and fugitive emissions. Combustive emission would come from construction equipment, employee commuting, and trucks, while fugitive emissions would come from equipment disturbing the construction site. The following sections describe the methodology used to estimate the emissions.

Combustive Emissions

For combustive emissions from construction equipment, the daily emissions were be calculated by multiplying the equipment horsepower, the load factor, the emission factor, and the hours of operation for a day. Project emissions were obtained by multiplying the equipment horsepower, the load factor, the emission factor, the hours of operation for a day and the numbers of days in the proposed action. Emission factors for the construction equipment from URBEMIS 2002 (Jones & Stokes Associates 2005) are shown in Table D-2

Vehicular emissions from employees commuting and truck trips were estimated by multiplying the number of vehicles per day, the number of trips, the distance traveled, and the emission factor. Project emissions were obtained by multiplying number of vehicles per day by the number of trips by the distance traveled by the numbers of days in the proposed action by the emission factor. It was assumed the average, one-way employee commute is 15 miles, while for the trucks delivering materials, an average, one-way trip of 45 miles was assumed. Emission factors for commuting employees and trucks hauling materials were obtained from California Air Resources Board's EMFAC 2002 (v2.2) BURDEN model run by the South Coast Air Quality Management District. The emission factors for employee commuting and delivery trucks are shown in Table D-2.

Table D-1: Equipment usage for Proposed Action.

Emission Source	Fuel	Power Rating (HP)	Load Factor	Number	Daily Hours	# of Days
Backhoe	D	90	0.465	1	8.0	254
Backhoe	D	80	0.465	1	4.0	254
Excavator	D	60	0.58	1	8.0	254
Air Compressor	D	48	0.62	1	1.0	254
Trencher	D	125	0.695	1	4.0	254
Vactron	D	36	0.62	1	1.0	254
Toe Cat - Bulldozer	D	200	0.575	1	6.0	254
Cable Plow - Bulldozer	D	200	0.575	1	6.0	254
Bulldozer	D	70	0.575	1	4.0	254
Backhoe	D	76	0.465	1	6.0	254
Trencher/Saw	D	185	0.695	1	6.0	254
Plow	D	70	0.575	1	6.0	254
Bulldozer	D	70	0.575	1	5.0	254
Pump	G	4.5	0.62	1	1.0	254
Generator	G	8	0.62	1	1.0	254
Blower	G	3	0.62	1	1.0	254
Wacker	G	3	0.62	1	2.0	254
Air Compressor	D	65	0.62	1	8.0	254
Bore Machine	D	85	0.75	1	4.0	254
Excavator	D	25.5	0.58	1	8	254
Vacuum	G	12	0.62	1	8	254
Asphalt Roller	D	16	0.43	1	4	254
Viber Plate	G	5.5	0.53	1	2	254
Water Truck	D	417	0.49	1	3	254
Dump Truck 10 yd^3[(a)]	NA	50	1	1	NA	254
Dump Truck 5 yd^3 [(a)]	NA	50	4	1	NA	254
Cement Truck [(a)]	NA	45	2	1	NA	254
Crew Trucks [(a)]	NA	40	2	4	NA	254
Foreman's Truck [(a)]	NA	40	1	1	NA	254
Employee Commuting [(a)]	NA	15	2	8	NA	254
Delivery Trucks [(a)]	NA	45	2	2	NA	254
Fugitive Dust Worst-Case Day[(b)]	NA	1.50	NA	NA	8	1
Fugitive Dust Average Day [(b)]	NA	0.50	NA	NA	8	253

(a) Power Rating is the number of miles traveled in one-way trip, and Number is the number of one-way trips.
(b) Power Rating is acres disturbed per day.

Table D-2: Construction equipment emission factors.

Emission Source	Emission Factors(gm/hr-hr)					Vehicle Category[a]
	CO	NO_x	PM_{10}	ROC	SO_x	
Backhoe	7.16	8.04	0.37	1.00	0.00	Tractors/Loaders/Backhoe
Backhoe	7.16	8.04	0.37	1.00	0.00	Tractors/Loaders/Backhoe
Excavator	8.49	5.95	0.20	1.00	0.00	Excavators
Air Compressor	7.13	8.01	0.37	1.00	0.00	Other Construction Equipment
Trencher	8.53	5.98	0.19	1.00	0.00	Trencher
Vactron	7.13	8.01	0.37	1.00	0.00	Other Construction Equipment
Toe Cat	7.14	8.01	0.37	1.00	0.00	Crawler Tractors
Cable Plow	7.14	8.01	0.37	1.00	0.00	Crawler Tractors
Bulldozer	7.14	8.01	0.37	1.00	0.00	Crawler Tractors
Backhoe	7.16	8.04	0.37	1.00	0.00	Tractors/Loaders/Backhoe
Trencher/Saw	8.53	5.98	0.19	1.00	0.00	Trencher
Plow	8.53	5.98	0.19	1.00	0.00	Trencher
Bulldozer	7.14	8.01	0.37	1.00	0.00	Crawler Tractors
Pump	198.00	4.79	0.30	6.13	0.26	Gas - SBCAPC Form 24
Generator	198.00	4.79	0.30	6.13	0.26	Gas - SBCAPC Form 24
Blower	198.00	4.79	0.30	6.13	0.26	Gas - SBCAPC Form 24
Wacker	198.00	4.79	0.30	6.13	0.26	Gas - SBCAPC Form 24
Air Compressor	7.13	8.01	0.37	1.00	0.00	Other Construction Equipment
Bore Machine	24.45	16.71	0.46	2.88	0.00	Bore/Drill Rigs
Excavator	8.49	5.95	0.20	1.00	0.00	Excavators
Vacuum	198.00	4.79	0.30	6.13	0.26	Gas - SBCAPC Form 24
Asphalt Roller	7.38	8.28	0.38	1.04	0.00	Paving Equipment
Viber Plate	198.00	4.79	0.30	6.13	0.26	Gas – SBCAPC Form 24
Water Truck	30.62	22.48	0.92	3.60	0.00	Off-Road Truck
Dump Truck 10 yd^3	0.005932	0.03893	0.00073	0.001321	0.000405	SCAQMD CEQA HHDT-DSL
Dump Truck 5 yd^3	0.019135	0.026756	0.000483	0.002779	0.000248	SCAQMD CEQA Delivery Trucks
Cement Truck	0.005932	0.03893	0.00073	0.001321	0.000405	SCAQMD CEQA HHDT-DSL
Crew Trucks	0.013925	0.001489	0.000080	0.001497	0.000009	SCAQMD CEQA Passenger Vehicles
Foreman's Truck	0.013925	0.001489	0.000080	0.001497	0.000009	SCAQMD CEQA Passenger Vehicles
Employee Commuting	0.013925	0.001489	0.000080	0.001497	0.000009	SCAQMD CEQA Passenger Vehicles
Delivery Trucks	0.005932	0.03893	0.00073	0.001321	0.000405	SCAQMD CEQA HHDT-DSL
Fugitive Dust	0.00	0.00	6.98	0.00	0.00	SBCAPCD Form 24[b]

(a) Emission factor from SCAQMD CEQA On-Road Vehicles are in lbs/mile.
(b) Emission factor is uncontrolled in units of lbs/acre-hr with PM_{10} fraction 0.64 and a Control Efficiency of 50%.

Fugitive Dust

Equipment operating on the construction site would disturb the soil and create fugitive dust. The average length of trench cut each day was estimate by dividing the total trench length by the number of days in the proposed action. The average area disturbed by trenching was estimated by multiplying the daily length of trench cut by an average corridor width of 20 feet that included the trench area, spoils pile, and a lane of traffic on both side of the trench. The area disturbed because of the installation of or maintenance on manways was estimated to be 20 by 30 feet, while for upgraded manways, an area 10 by 20 was estimated to be disturbed. For the installed manways, it was assumed to take five days to install each manway, so the total number of installed manways was divided by the number of days in the proposed action and multiplied by five to obtain the average daily manways disturbed. For upgraded manways, the total number of upgrade manways was divided by the number of days in the proposed action to obtain the average daily manways disturbed. These two numbers were multiplied by the area disturbed to obtain a daily area disturbed by

installation and upgrading of manways. The total average daily disturbed area was obtained by summing these two smaller areas. The reasonable worst case day was assumed to disturb three times the area of an average day.

Daily fugitive dust emission were estimated by multiplying the total area disturbed by the hours of operation by the emission factor of 3.49 pounds of PM_{10} per acre per hour. The project emissions were estimated by multiplying the total area disturbed by the hours of operation by the emission factor of 3.49 pounds of PM_{10} per acre per hour by the number of days in the proposed action. The 3.49 pounds per acre per hour emission factor includes a PM_{10} fraction 0.64, and a 50% reduction in PM_{10} from site watering.

Table D-3: Estimated daily emissions.

Emission Source	Daily Emissions (Lbs)				
	CO	NO_x	PM_{10}	ROC	SO_x
Backhoe	5.29	5.94	0.27	0.74	0.00
Backhoe	2.35	2.64	0.12	0.33	0.00
Excavator	5.21	3.65	0.12	0.61	0.00
Air Compressor	0.47	0.53	0.02	0.07	0.00
Trencher	6.53	4.58	0.15	0.77	0.00
Vactron	0.35	0.39	0.02	0.05	0.00
Toe Cat - Bulldozer	10.86	12.19	0.56	1.52	0.00
Cable Plow - Bulldozer	10.86	12.19	0.56	1.52	0.00
Bulldozer	2.53	2.84	0.13	0.35	0.00
Backhoe	3.35	3.76	0.17	0.47	0.00
Trencher/Saw	14.51	10.17	0.32	1.70	0.00
Plow	4.54	3.18	0.10	0.53	0.00
Bulldozer	3.17	3.56	0.16	0.44	0.00
Pump	1.22	0.03	0.00	0.04	0.00
Generator	2.17	0.05	0.00	0.07	0.00
Blower	0.81	0.02	0.00	0.03	0.00
Wacker	1.62	0.04	0.00	0.05	0.00
Air Compressor	5.07	5.69	0.26	0.71	0.00
Bore Machine	13.75	9.39	0.26	1.62	0.00
Excavator	2.22	1.55	0.05	0.26	0.00
Vacuum	25.98	0.63	0.04	0.80	0.03
Asphalt Roller	0.45	0.50	0.02	0.06	0.00
Viber Plate	2.54	0.06	0.00	0.08	0.00
Water Truck	41.38	30.38	1.24	4.87	0.00
Dump Truck 10 yd3	0.30	1.95	0.04	0.07	0.02
Dump Truck 5 yd3	3.83	5.35	0.10	0.56	0.05
Cement Truck	0.53	3.50	0.07	0.12	0.04
Crew Trucks	4.46	0.48	0.03	0.48	0.00
Foreman's Truck	0.56	0.06	0.00	0.06	0.00
Employee Commuting	3.34	0.36	0.02	0.36	0.00
Delivery Trucks	1.07	7.01	0.13	0.24	0.07
Fugitive Dust Worst-Case Day	0.00	0.00	41.82	0.00	0.00
Total	181.29	132.67	46.79	19.57	0.23

Table D-4: Estimated Proposed Action emissions.

Emission Source	Project Emissions (Lbs)				
	CO	NO_x	PM_{10}	ROC	SO_x
Backhoe	1,343	1,508	69	188	0
Backhoe	597	670	31	84	0
Excavator	1,324	928	30	156	0
Air Compressor	119	133	6	17	0
Trencher	1,660	1,164	37	195	0
Vactron	89	100	5	13	0
Toe Cat	2,758	3,096	141	386	0
Cable Plow	2,758	3,096	141	386	0
Bulldozer	643	722	33	90	0
Backhoe	850	955	44	119	0
Trencher/Saw	3,685	2,583	82	432	0
Plow	1,154	809	26	135	0
Bulldozer	804	903	41	113	0
Pump	309	7	0	10	0
Generator	550	13	1	17	1
Blower	206	5	0	6	0
Wacker	412	10	1	13	1
Air Compressor	1,288	1,446	67	181	0
Bore Machine	3,491	2,386	66	411	0
Excavator	563	394	13	66	0
Vacuum	6,599	160	10	204	9
Asphalt Roller	114	128	6	16	0
Viber Plate	646	16	1	20	1
Water Truck	10,510	7,716	316	1,236	0
Dump Truck 10 yd3	75	494	9	17	5
Dump Truck 5 yd3	972	1,359	25	141	13
Cement Truck	136	890	17	30	9
Crew Trucks	1,132	121	6	122	1
Foreman's Truck	141	15	1	15	0
Employee Commuting	849	91	5	91	1
Delivery Trucks	271	1,780	33	60	19
Fugitive Dust	0	0	3,527	0	0
Total (Lbs)	46,049	33,699	4,790	4,970	58
Total (Tons)	23.02	16.85	2.40	2.48	0.03

Cumulative Emissions

To fully assess the impacts from the Proposed Action, emissions from installation of fiber optical cable for the Lion's Head and Vandenberg Telemetry Receiving Station (VTRS) segments must be examined. Emissions from these two projects were extracted from the Final Environmental Assessment for the Installation of Lion's Head Fiber-Optic Cable System Vandenberg AFB, California (Tetra Tech, 2000) and the Final Environmental Assessment VTRS Fiber Optic Cable Installation on South Base, Vandenberg AFB, California (U.S. AF 2004), respectively. A summary of the emissions from construction of the Proposed Action and Lion's Head and VTRS segments are presented in Table D-5.

Table D-5: Cumulative emissions.

Action	Emissions				
	CO	NO_x	PM_{10}	ROC	SO_x
Daily Emissions (Lbs/day)					
Proposed Action	181.29	132.67	46.79	19.57	0.23
Lion's Head	151.52	251.20	16.48	34.78	23.01
VTS Upgrade	19.40	44.10	203.20	4.50	0.80
Total (Lbs/Day)	352.21	427.97	266.47	58.85	24.04
Project Emissions (Tons)					
Proposed Action	23.02	16.85	2.40	2.48	0.03
Lion's Head	1.24	2.16	0.14	0.30	0.20
VTS Upgrade	3.04	5.17	1.47	0.58	0.09
Total Emissions (Tons)	27.31	24.18	4.01	3.36	0.32

References

Jones & Stokes Associates. 2005. Software User's Guide: URBEMIS2002 for Windows with Enhanced Construction Module. Version 8.7 Emissions Estimation for Land Use Development Projects. Sacramento. April.

Santa Barbara County APCD. 2004. Clear Air Plan. Santa Barbara.

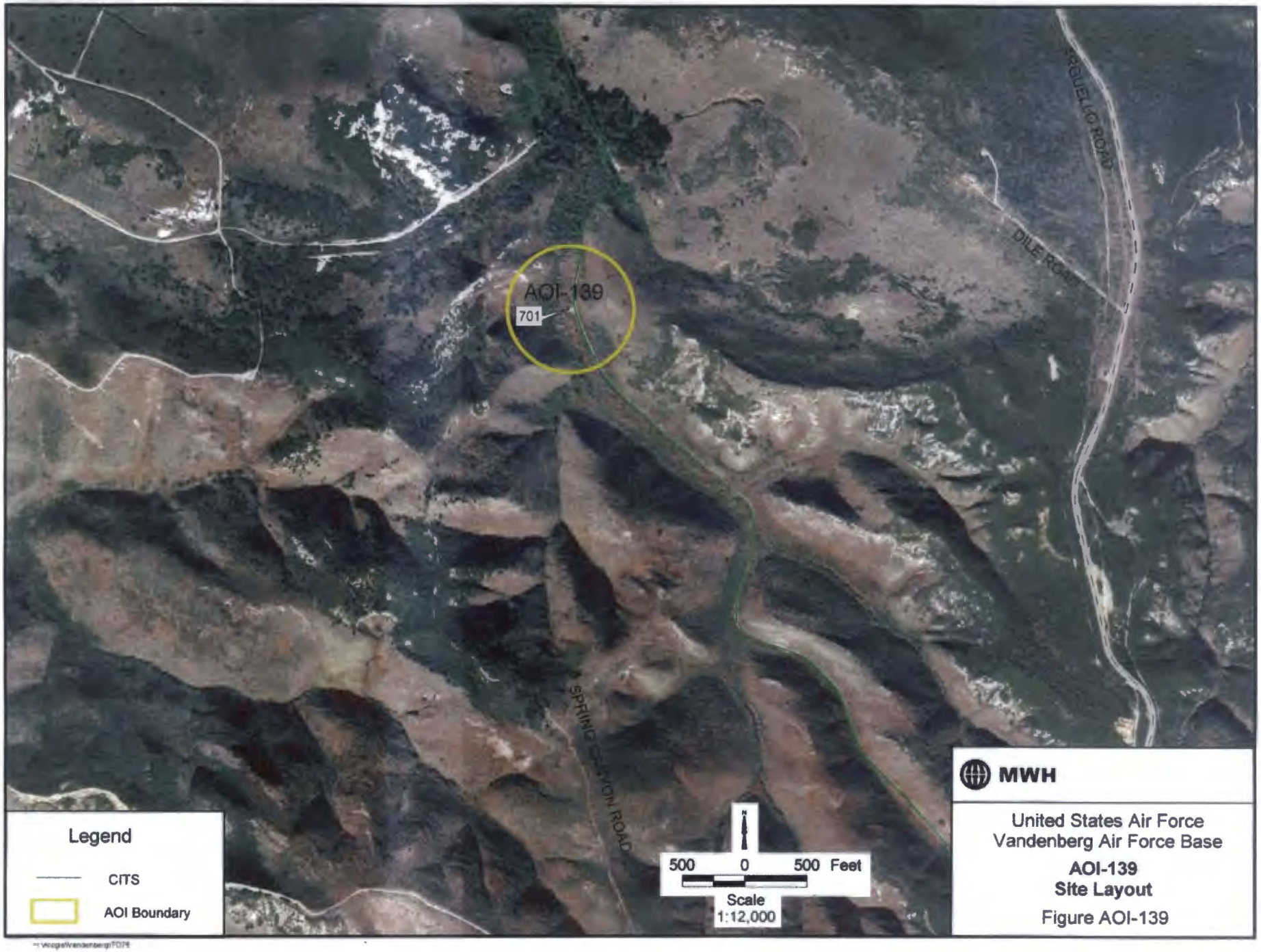
Tetra Tech. 2000. Final Environmental Assessment for the Installation of Lion's Head Fiber-Optic Cable System Vandenberg AFB, California.

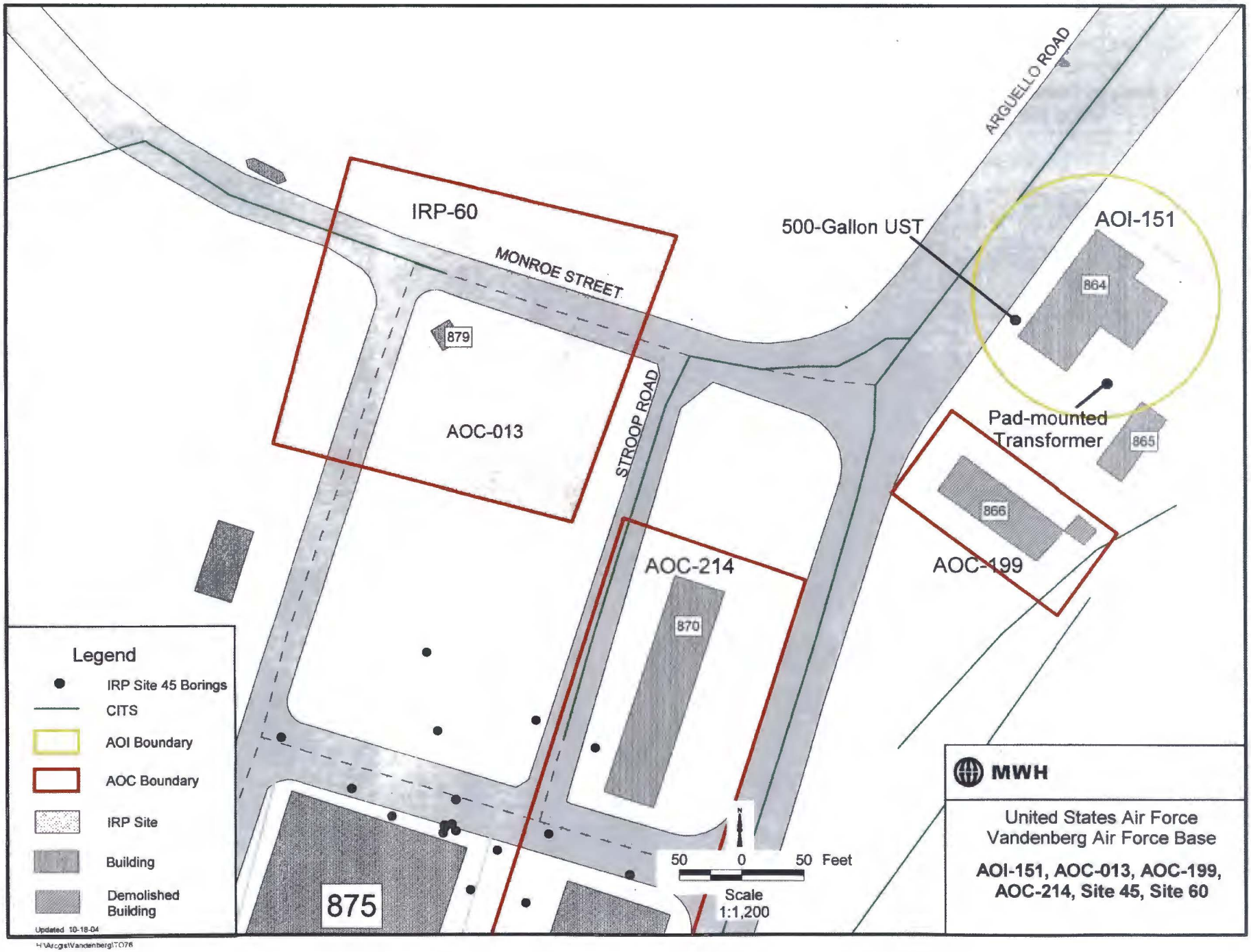
U.S. Air Force. 2004. Final Environmental Assessment VTRS Fiber Optic Cable Installation on South Base, Vandenberg AFB, California.

U.S. EPA. 2003. Federal Register, Volume 68, Number 131, July 9, 2003. pp 40789-40891.

APPENDIX E

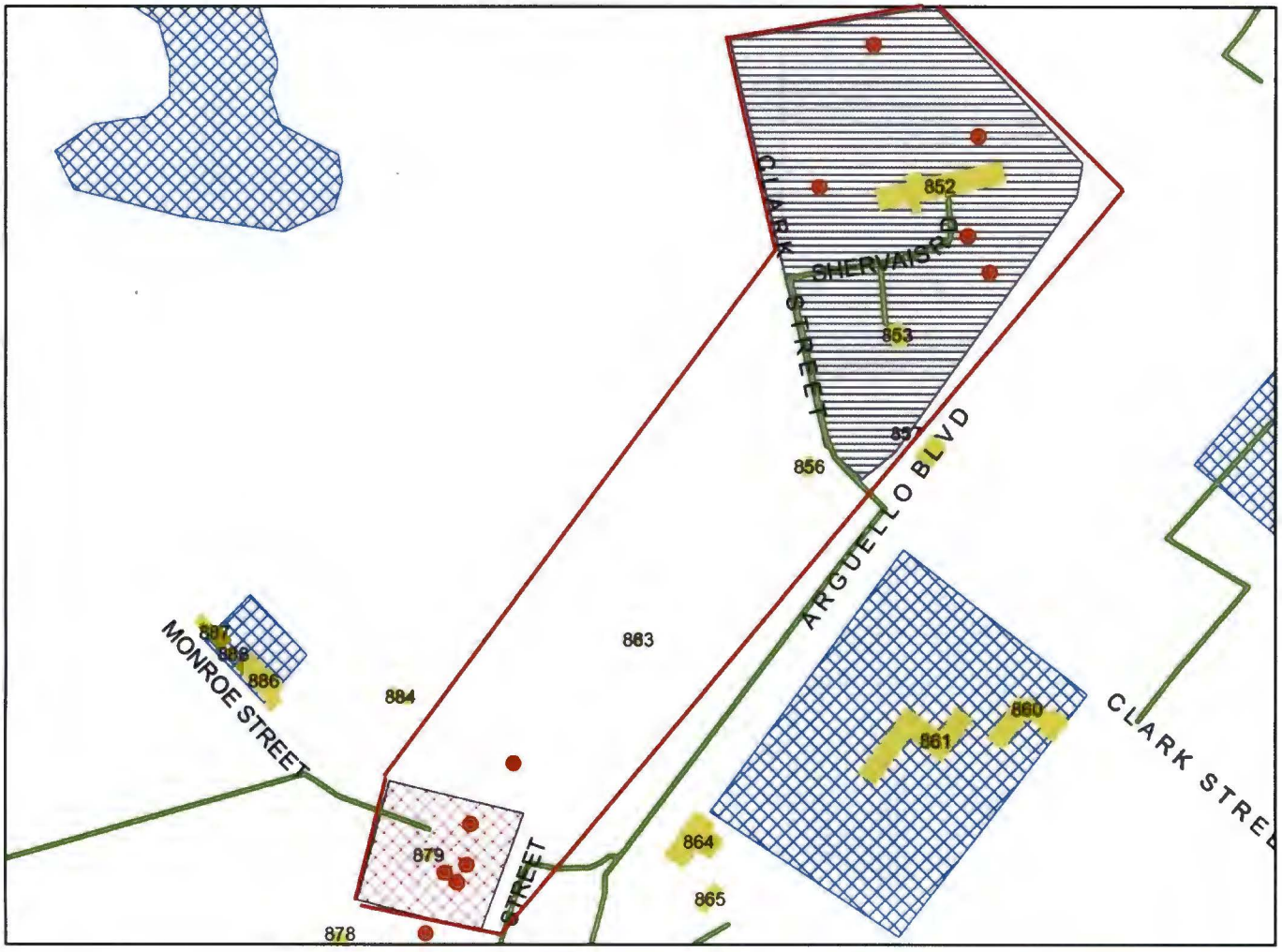
Installation Restoration Program


AOI-139
701
ROUELLO ROAD
DILE ROAD
SPRING CANYON ROAD
Legend
CITS
AOI Boundary
500 0 500 Feet
Scale
1:12,000
MWH
United States Air Force
Vandenberg Air Force Base
AOI-139
Site Layout
Figure AOI-139


IRP-60
MONROE STREET
879
AOC-013
STROOP ROAD
ARGUELLO ROAD
500-Gallon UST
AOI-151
864
Pad-mounted
Transformer
865
866
AOC-199
AOC-214
870
875
Legend
IRP Site 45 Borings
CITS
AOI Boundary
AOC Boundary
IRP Site
Building
Demolished
Building
Updated 10-18-04
H:\Arcgis\Vandenberg\TO76
50 0 50 Feet
Scale
1:1,200
MWH
United States Air Force
Vandenberg Air Force Base
AOI-151, AOC-013, AOC-199,
AOC-214, Site 45, Site 60

CITS Project

IRP Site 60



TT Groundwater Monitoring Pts
cits_all
Edge of Pavement
Buildings
Actual site boundary

Status
Closed
Action Required
Open
Open
Closed

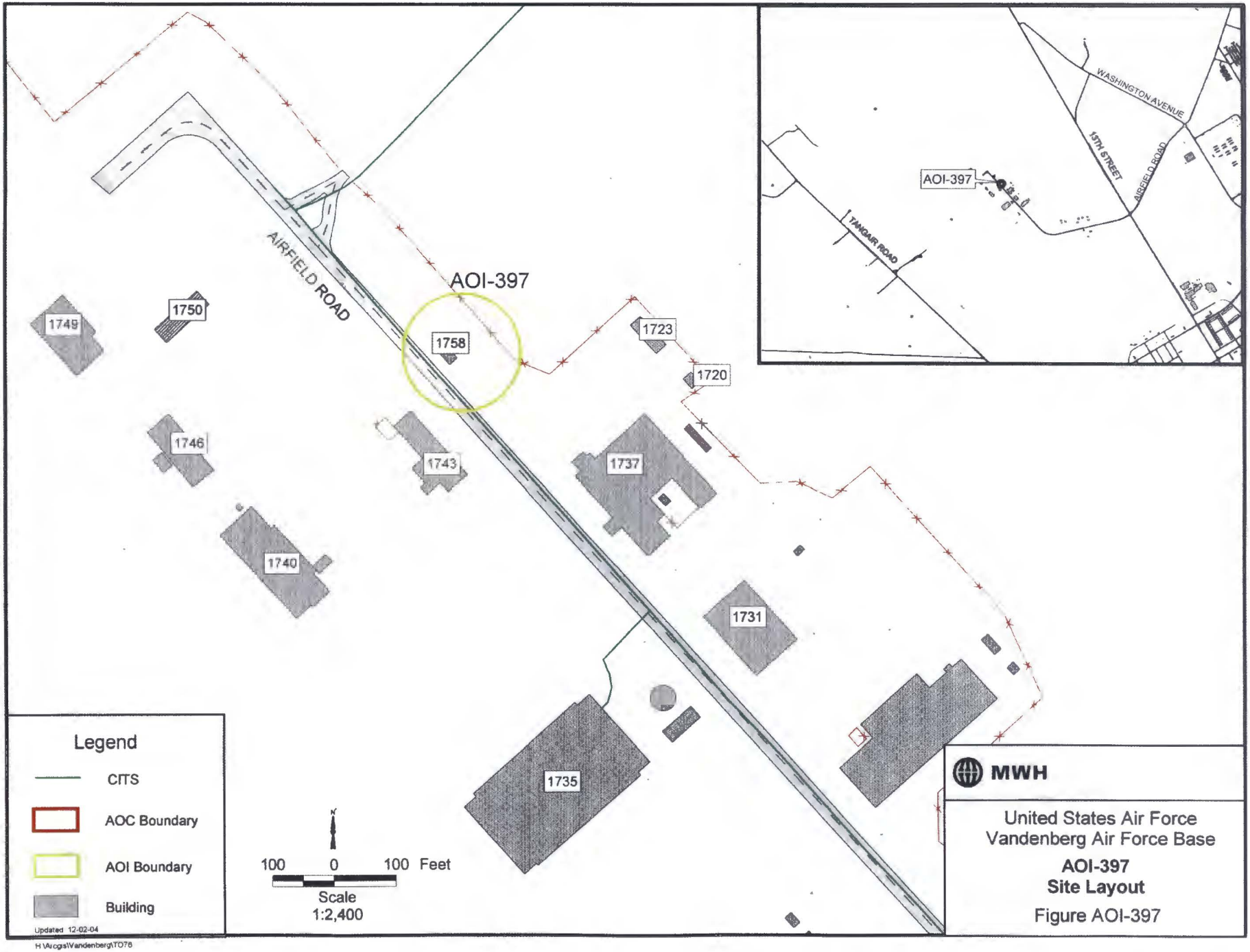
NAME
OCEAN
OFFBASE

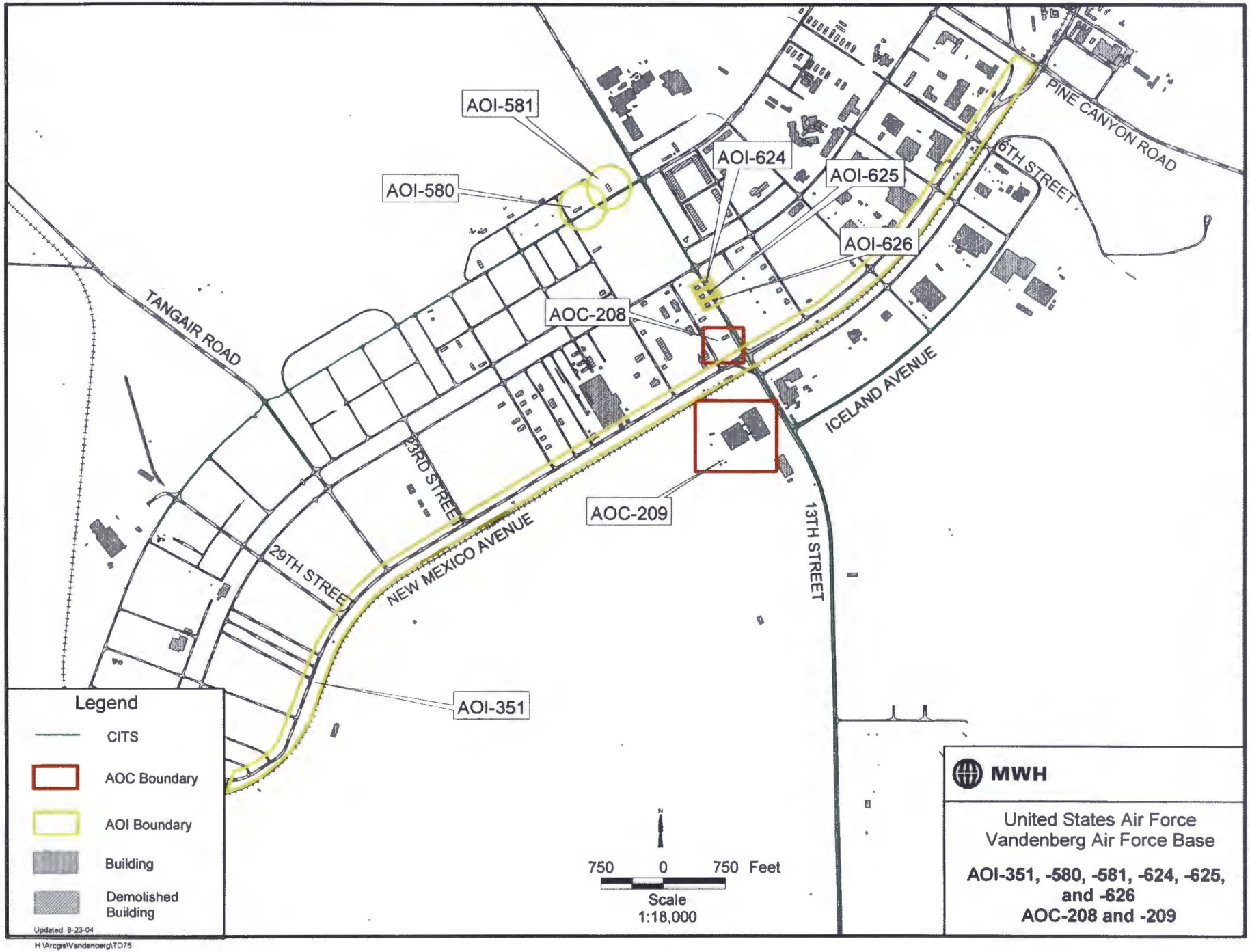
N
W E
S

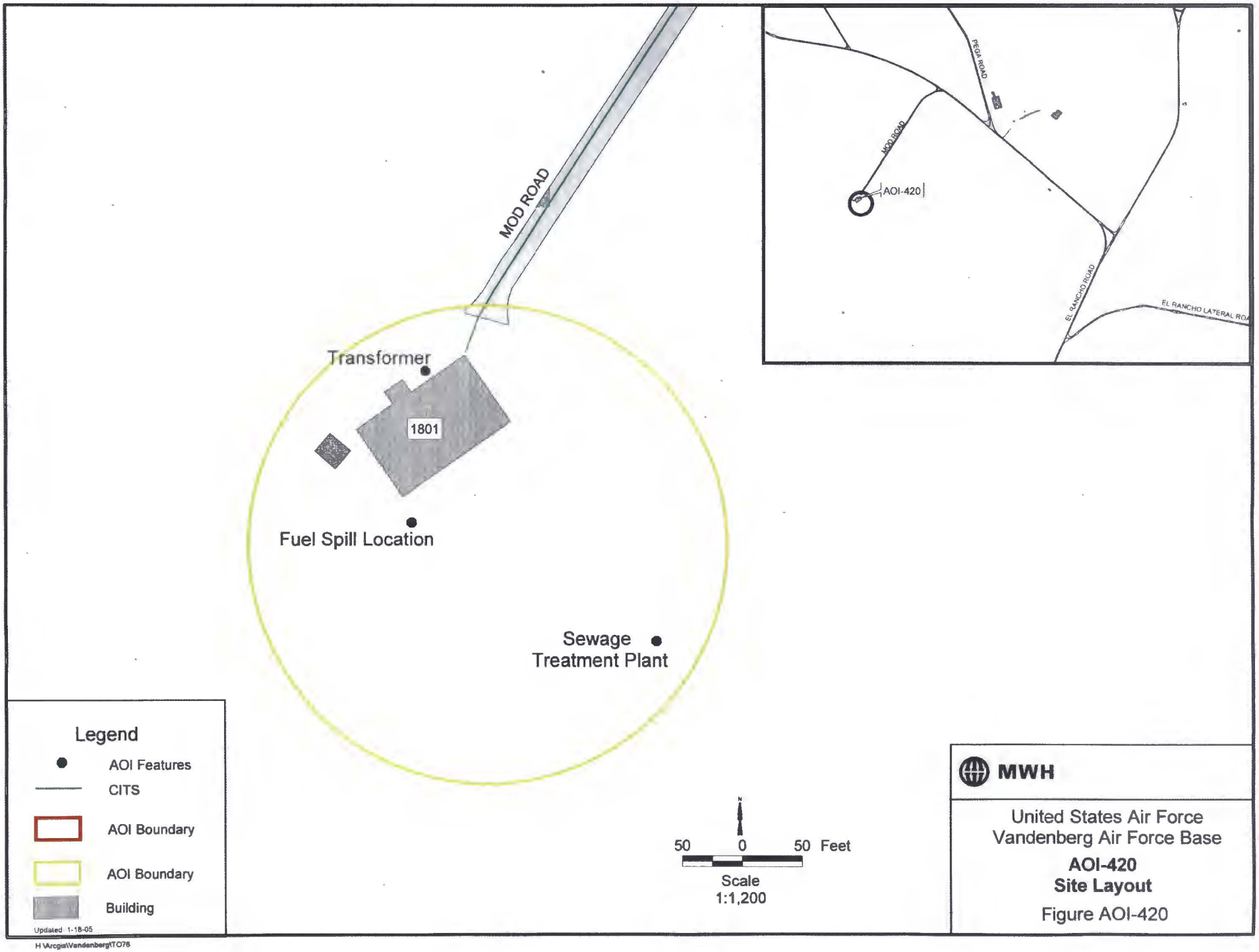
0 130 260 520 780 1,040 Feet

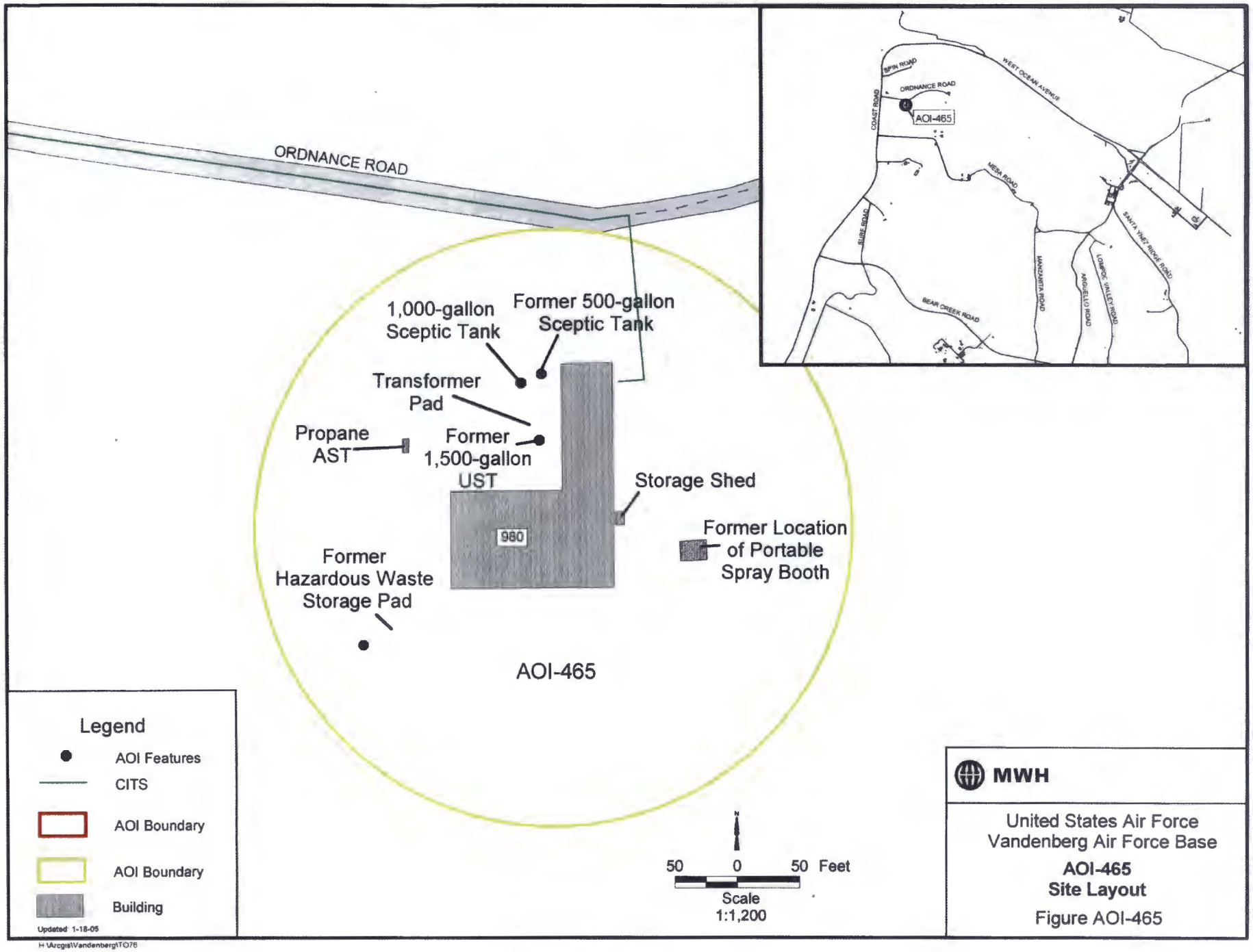
0 37.5 75 150 225 300 Meters

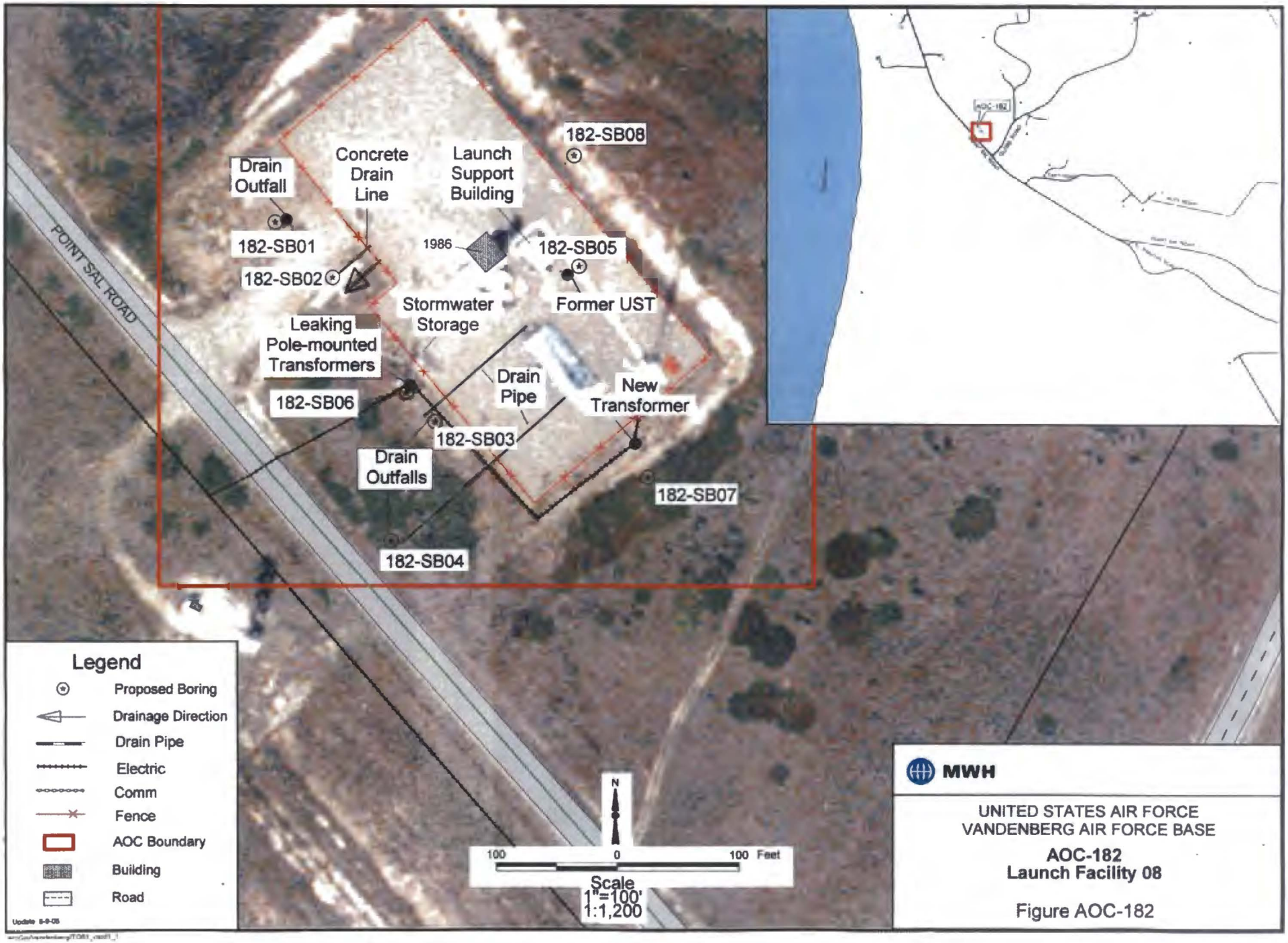
Map generation date: 3/22/2006

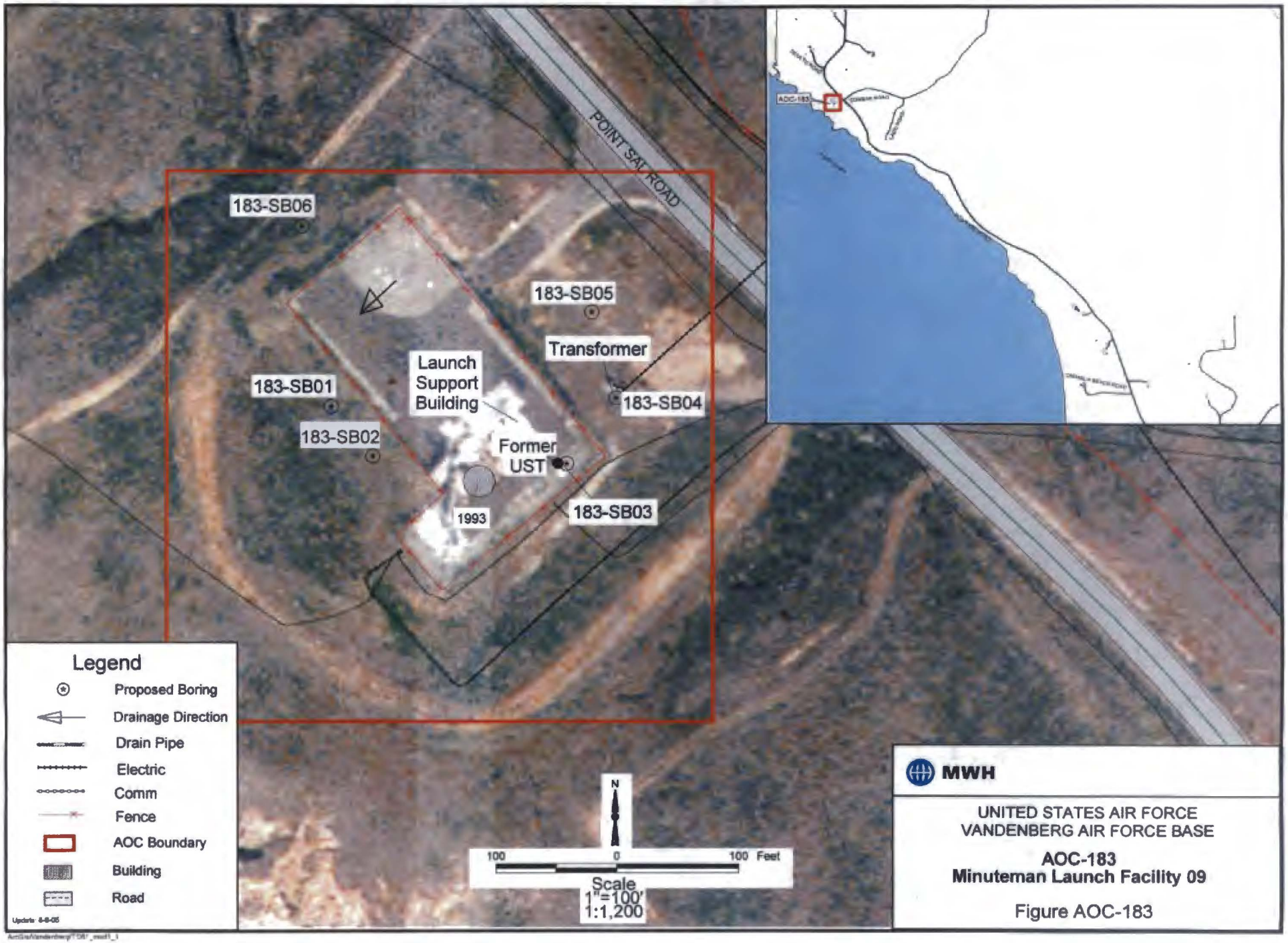

AIRFIELD ROAD
AOI-397
1749
1750
1758
1723
1720
1746
1743
1737
1740
1731
1735
WASHINGTON AVENUE
13TH STREET
AIRFIELD ROAD
TANDAIR ROAD
AOI-397
Legend
CITS
AOC Boundary
AOI Boundary
Building
Updated 12-02-04
H:\Arcgis\Vandenberg\TO76
100 0 100 Feet
Scale
1:2,400
MWH
United States Air Force
Vandenberg Air Force Base
AOI-397
Site Layout
Figure AOI-397

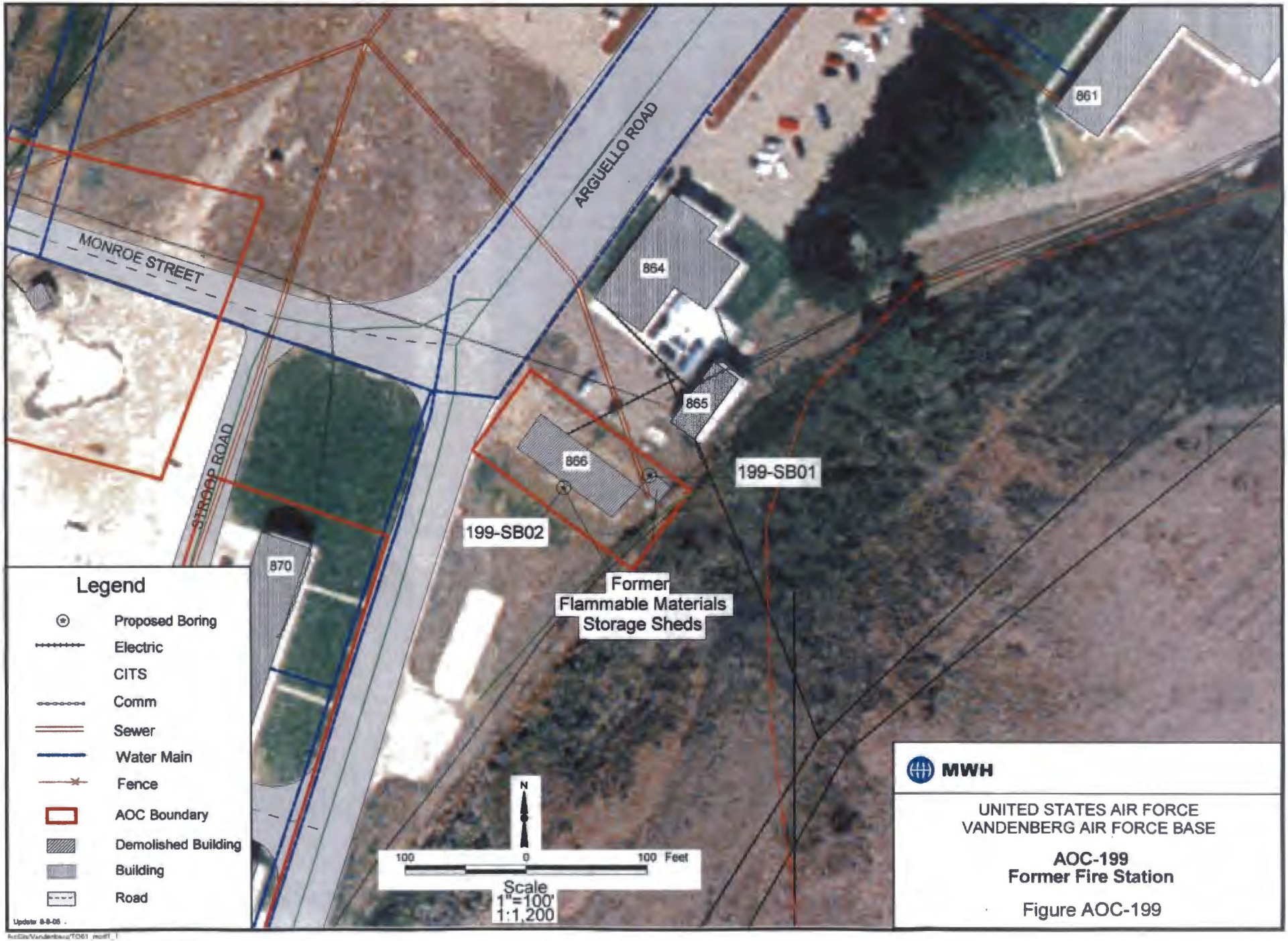

AOI-581
AOI-580
AOI-624
AOI-625
AOI-626
AOC-208
AOC-209
AOI-351
PINE CANYON ROAD
6TH STREET
TANGAIR ROAD
ICELAND AVENUE
23RD STREET
29TH STREET
NEW MEXICO AVENUE
13TH STREET
Legend
CITS
AOC Boundary
AOI Boundary
Building
Demolished Building
Updated 8-23-04
H:\Arcgis\Vandenberg\TO76
N
750 0 750 Feet
Scale
1:18,000
MWH
United States Air Force
Vandenberg Air Force Base
AOI-351, -580, -581, -624, -625, and -626
AOC-208 and -209


MOD ROAD
Transformer
1801
Fuel Spill Location
Sewage
Treatment Plant
PEGA ROAD
MOD ROAD
AOI-420
EL RANCHO ROAD
EL RANCHO LATERAL ROA
Legend
AOI Features
CITS
AOI Boundary
AOI Boundary
Building
Updated 1-18-05
H:\Arcgis\Vandenberg\TO76
N
50 0 50 Feet
Scale
1:1,200
MWH
United States Air Force
Vandenberg Air Force Base
AOI-420
Site Layout
Figure AOI-420

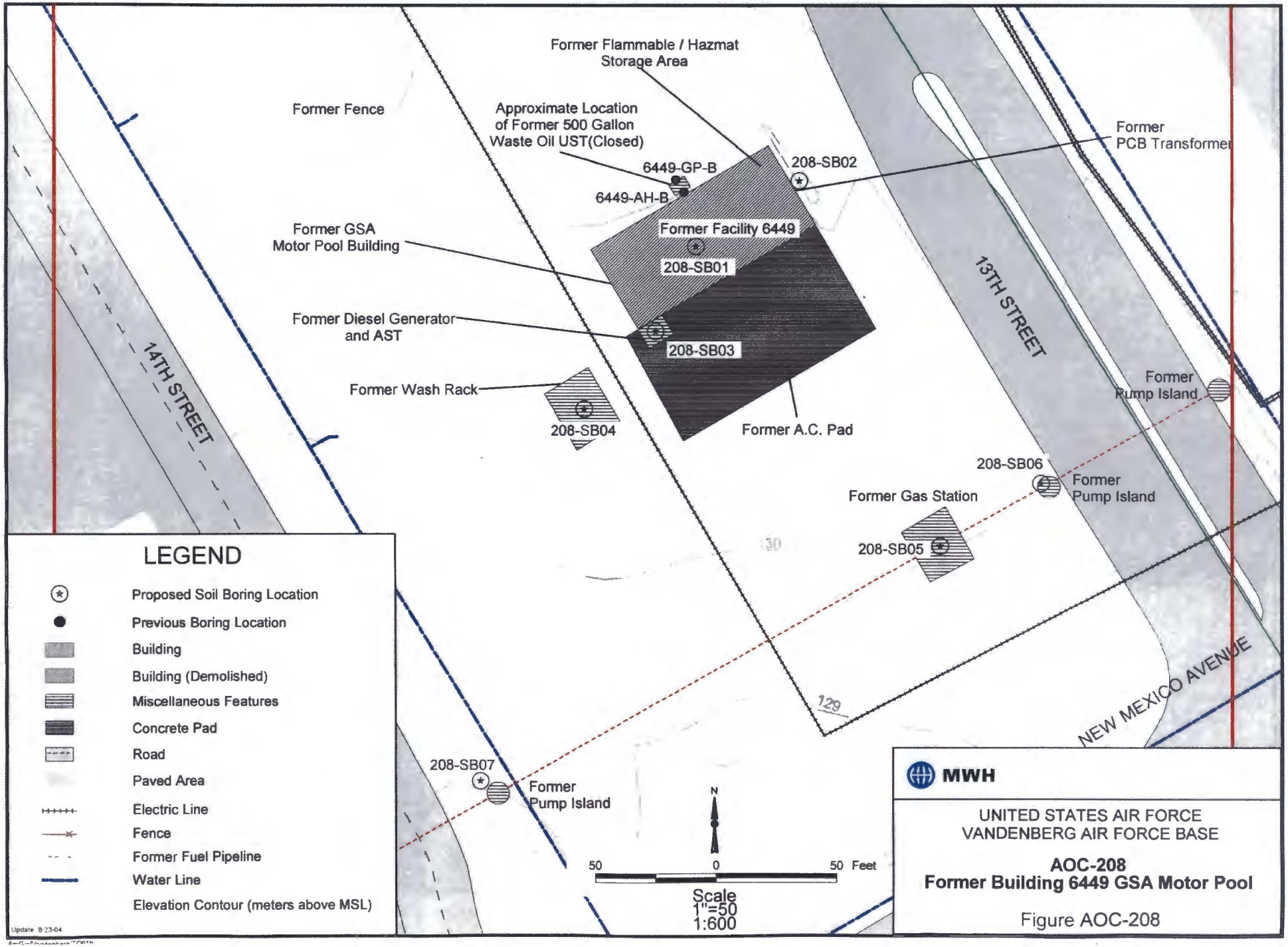

ORDNANCE ROAD
1,000-gallon Sceptic Tank
Former 500-gallon Sceptic Tank
Transformer Pad
Propane AST
Former 1,500-gallon UST
Storage Shed
980
Former Location of Portable Spray Booth
Former Hazardous Waste Storage Pad
AOI-465
WEST OCEAN AVENUE
SPIN ROAD
ORDNANCE ROAD
COAST ROAD
AOI-465
MESA ROAD
SURF ROAD
BEAR CREEK ROAD
MANZANITA ROAD
ARGUELLO ROAD
LOMPOC VALLEY ROAD
SANTA YNEZ RIDGE ROAD
Legend
AOI Features
CITS
AOI Boundary
AOI Boundary
Building
Updated: 1-18-05
H:\Arcgis\Vandenberg\TO76
50 0 50 Feet
Scale 1:1,200
MWH
United States Air Force
Vandenberg Air Force Base
AOI-465
Site Layout
Figure AOI-465


Drain Outfall
Concrete Drain Line
Launch Support Building
182-SB08
182-SB01
182-SB02
1986
182-SB05
Former UST
Stormwater Storage
Leaking Pole-mounted Transformers
182-SB06
Drain Pipe
New Transformer
182-SB03
Drain Outfalls
182-SB07
182-SB04
POINT SAL ROAD
AOC-182
Legend
Proposed Boring
Drainage Direction
Drain Pipe
Electric
Comm
Fence
AOC Boundary
Building
Road
Update 8-8-05
N
100
0
100 Feet
Scale
1"=100'
1:1,200
MWH
UNITED STATES AIR FORCE
VANDENBERG AIR FORCE BASE
AOC-182
Launch Facility 08
Figure AOC-182


POINT SAL ROAD
183-SB06
183-SB05
Transformer
Launch Support Building
183-SB01
183-SB04
183-SB02
Former UST
1993
183-SB03
AOC-183
Legend
Proposed Boring
Drainage Direction
Drain Pipe
Electric
Comm
Fence
AOC Boundary
Building
Road
Update 6-8-05
N
100 0 100 Feet
Scale
1"=100'
1:1,200
MWH
UNITED STATES AIR FORCE
VANDENBERG AIR FORCE BASE
AOC-183
Minuteman Launch Facility 09
Figure AOC-183


ARGUELLO ROAD
MONROE STREET
SURFSIDE ROAD
861
864
865
866
870
199-SB01
199-SB02
Former
Flammable Materials
Storage Sheds
Legend
Proposed Boring
Electric
CITS
Comm
Sewer
Water Main
Fence
AOC Boundary
Demolished Building
Building
Road
Update 8-8-05
N
100
0
100 Feet
Scale
1"=100'
1:1,200
MWH
UNITED STATES AIR FORCE
VANDENBERG AIR FORCE BASE
AOC-199
Former Fire Station
Figure AOC-199


185-SB02
Concrete-lined Drainage Ditch Terminus
Concrete-lined Drainage Ditch
PARQUEE ROAD
POINT SAL ROAD
185-SB03
Partially Open Silo
1965
185-SB04
Former UST
Drain Outfalls
185-SB01
Legend
Proposed Boring
Drainage Direction
Drain Pipe
Electric
Comm
Fence
AOC Boundary
Building
Road
N
100 0 100 Feet
Scale 1"=100' 1:1,200
MWH
UNITED STATES AIR FORCE
VANDENBERG AIR FORCE BASE
AOC-185
Minuteman Launch Facility 24
Figure AOC-185


Former Flammable / Hazmat Storage Area
Former Fence
Approximate Location of Former 500 Gallon Waste Oil UST(Closed)
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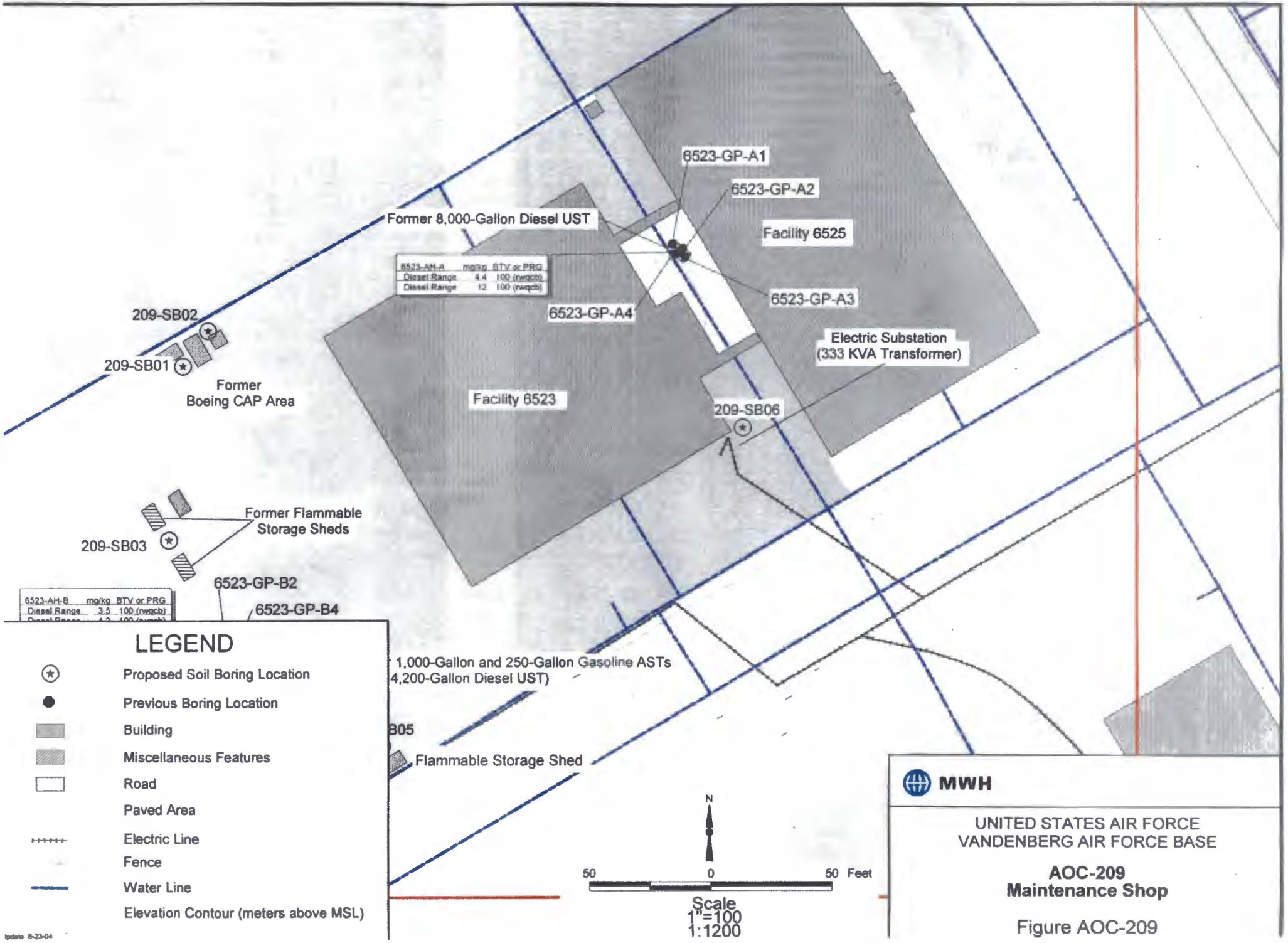
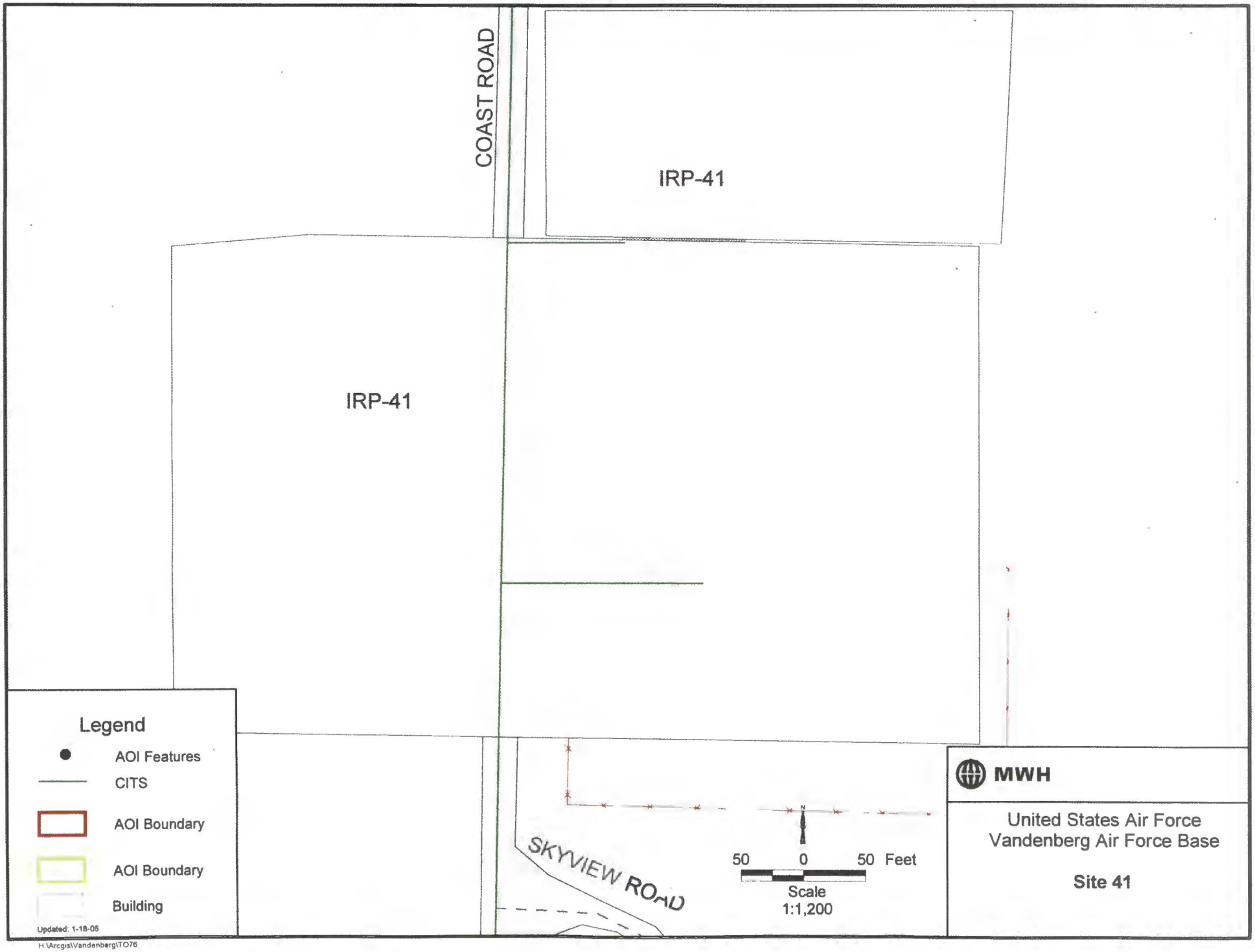
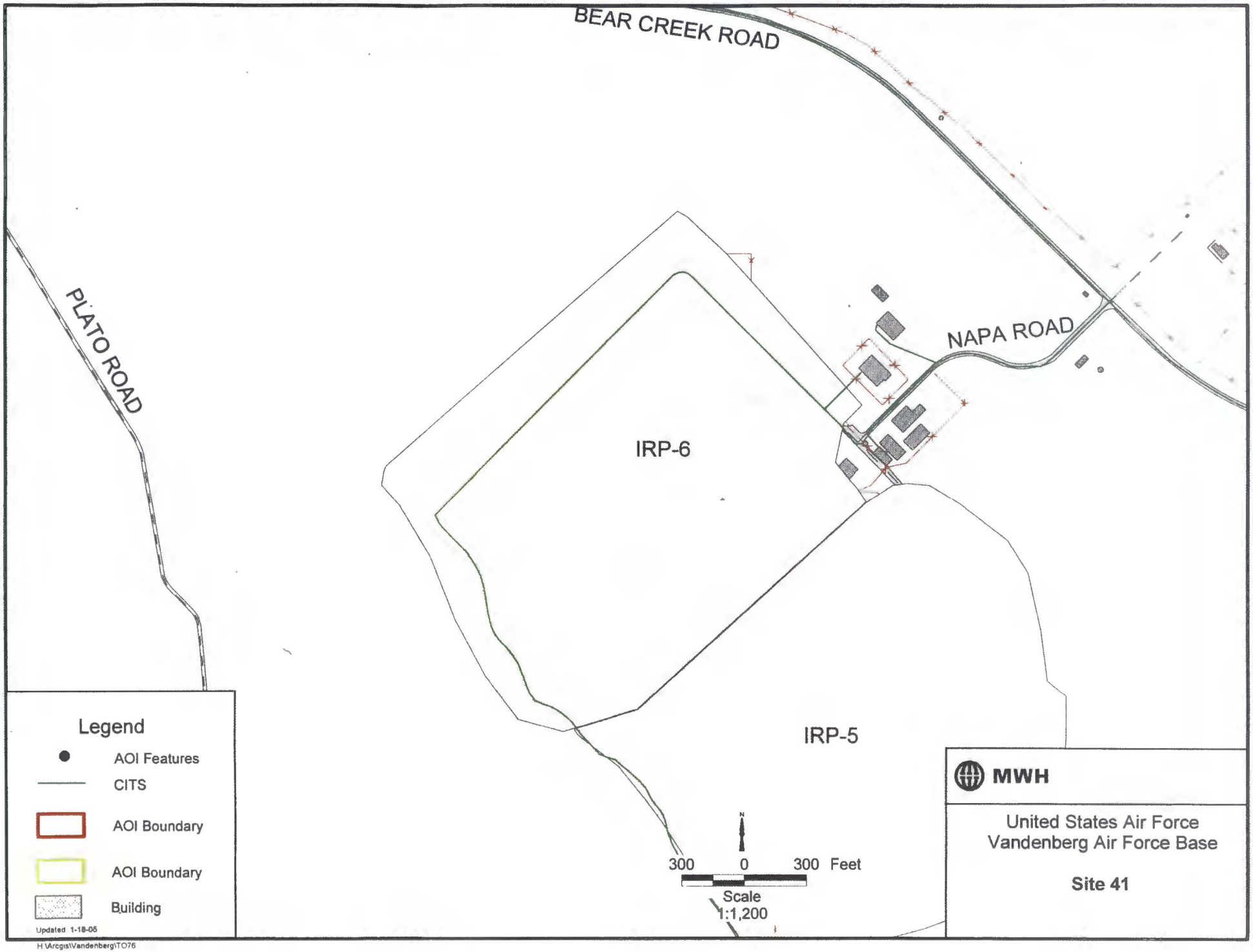
6449-AH-B
208-SB02
Former PCB Transformer
Former GSA Motor Pool Building
Former Facility 6449
208-SB01
Former Diesel Generator and AST
208-SB03
Former Wash Rack
208-SB04
Former A.C. Pad
14TH STREET
13TH STREET
Former Pump Island
208-SB06
Former Pump Island
Former Gas Station
208-SB05
30
129
NEW MEXICO AVENUE
208-SB07
Former Pump Island
N
50 0 50 Feet
Scale 1"=50 1:600
LEGEND
Proposed Soil Boring Location
Previous Boring Location
Building
Building (Demolished)
Miscellaneous Features
Concrete Pad
Road
Paved Area
Electric Line
Fence
Former Fuel Pipeline
Water Line
Elevation Contour (meters above MSL)
Update 8-23-04
MWH
UNITED STATES AIR FORCE
VANDENBERG AIR FORCE BASE
AOC-208
Former Building 6449 GSA Motor Pool
Figure AOC-208


6523-GP-A1
6523-GP-A2
Former 8,000-Gallon Diesel UST
Facility 6525
6523-AH-A mg/kg BTV or PRG
Diesel Range 4.4 100 (rwqcb)
Diesel Range 12 100 (rwqcb)
6523-GP-A3
6523-GP-A4
209-SB02
209-SB01
Former
Boeing CAP Area
Electric Substation
(333 KVA Transformer)
Facility 6523
209-SB06
Former Flammable
Storage Sheds
209-SB03
6523-GP-B2
6523-AH-B mg/kg BTV or PRG
Diesel Range 3.5 100 (rwqcb)
6523-GP-B4
1,000-Gallon and 250-Gallon Gasoline ASTs
4,200-Gallon Diesel UST)
B05
Flammable Storage Shed
LEGEND
Proposed Soil Boring Location
Previous Boring Location
Building
Miscellaneous Features
Road
Paved Area
Electric Line
Fence
Water Line
Elevation Contour (meters above MSL)
N
50 0 50 Feet
Scale
1"=100
1:1200
MWH
UNITED STATES AIR FORCE
VANDENBERG AIR FORCE BASE
AOC-209
Maintenance Shop
Figure AOC-209
Update 8-23-04


COAST ROAD
IRP-41
IRP-41
SKYVIEW ROAD
Legend
AOI Features
CITS
AOI Boundary
AOI Boundary
Building
Updated: 1-18-05
H:\Arcgis\Vandenberg\TO76
50 0 50 Feet
Scale
1:1,200
MWH
United States Air Force
Vandenberg Air Force Base
Site 41


BEAR CREEK ROAD
PLATO ROAD
NAPA ROAD
IRP-6
IRP-5
Legend
AOI Features
CITS
AOI Boundary
AOI Boundary
Building
Updated 1-18-06
H:\Arcgis\Vandenberg\TO76
300 0 300 Feet
Scale
1:1,200
MWH
United States Air Force
Vandenberg Air Force Base
Site 41

CITS Project

IRP Site 50

TT Groundwater Monitoring Pts
cits_all
Edge of Pavement
Buildings
Actual site boundary

Status
Closed
Action Required
Open
Open
Closed

NAME
OCEAN
OFFBASE

N
W E
S

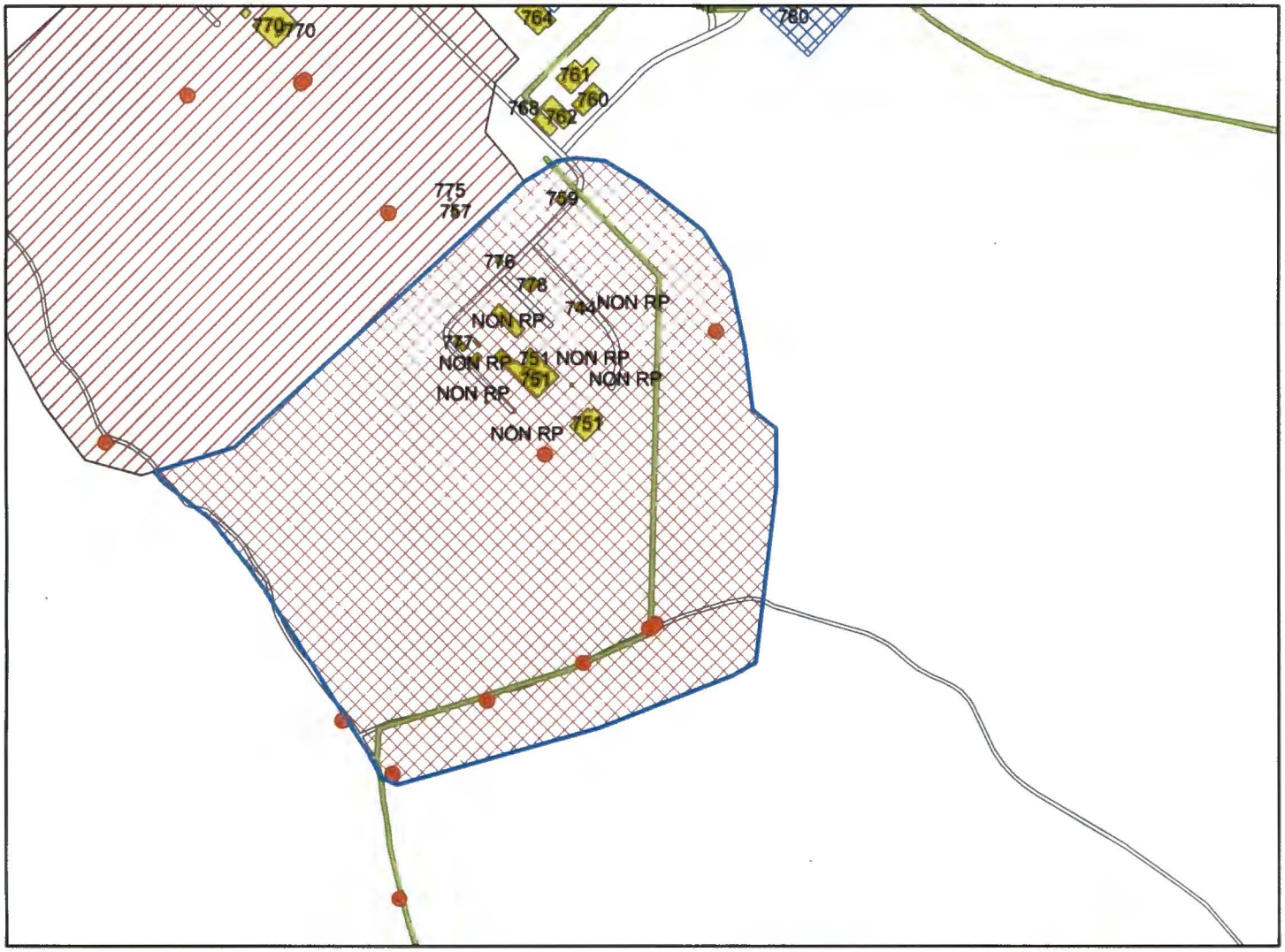
0 150 300 600 900 1,200 Feet

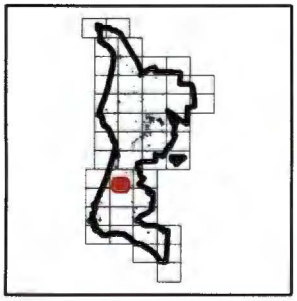
0 45 90 180 270 360 Meters

Map generation date: 3/22/2006

CITS Project

Site 5 Cluster (SLC-3 E/W)





TT Groundwater Monitoring Pts
cits_all
Edge of Pavement
Buildings

Status
Closed
Action Required
Open
Open
Closed

NAME
OCEAN
OFFBASE

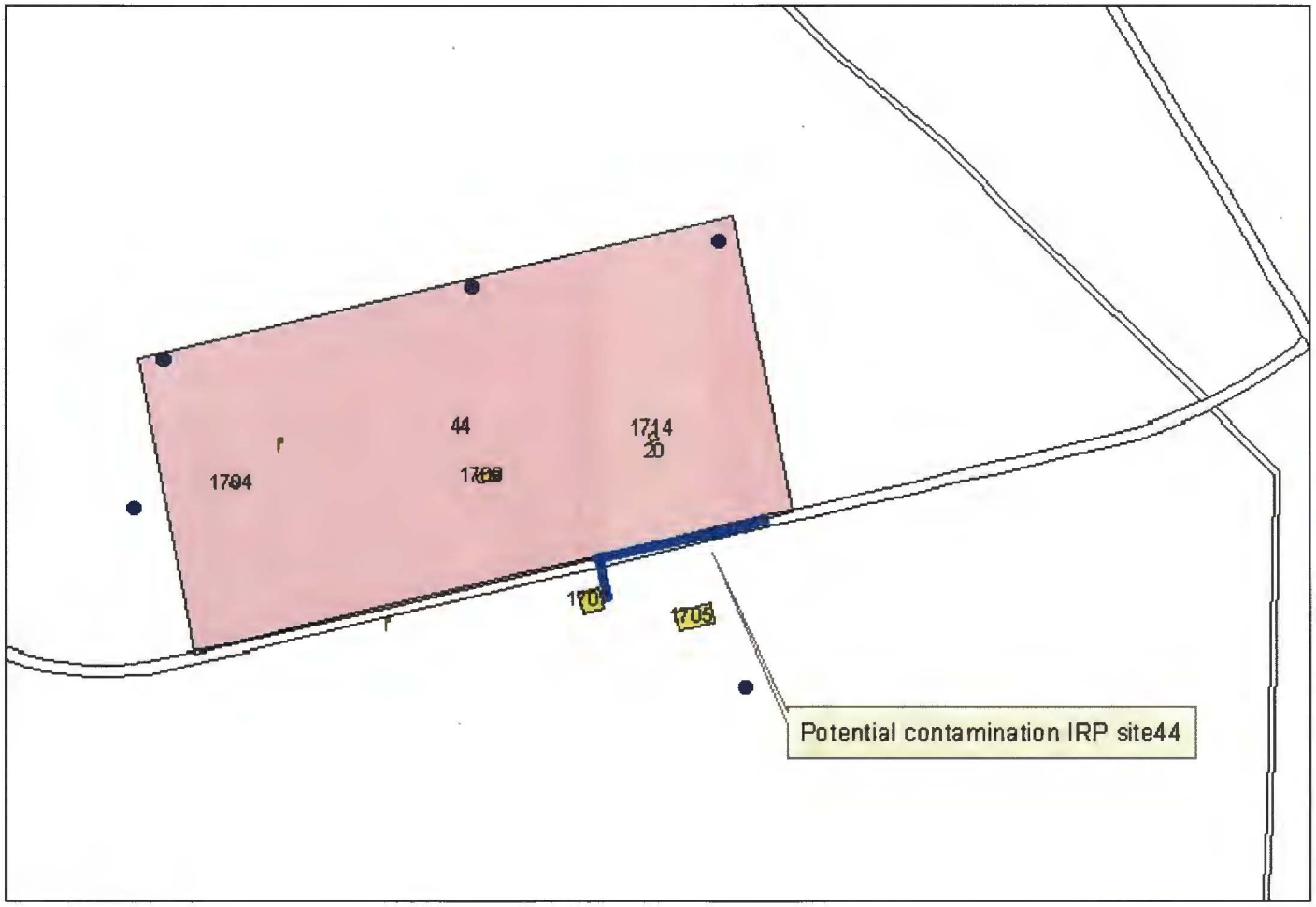
N
W E
S

0 250 500 1,000 1,500 2,000 Feet

0 75 150 300 450 600 Meters

Map generation date: 3/22/2006

IRP Site 44



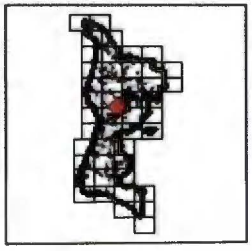
cits_all
Edge of Pavement
FH USTs
JE Surveyed USTs
MK Surveyed USTs
USBR USTs
Sampling Points
Buildings

Status

Closed
Action Required
Open
Base Grid
VAFB Boundary

NAME

OCEAN
OFF BASE



N
W E
S

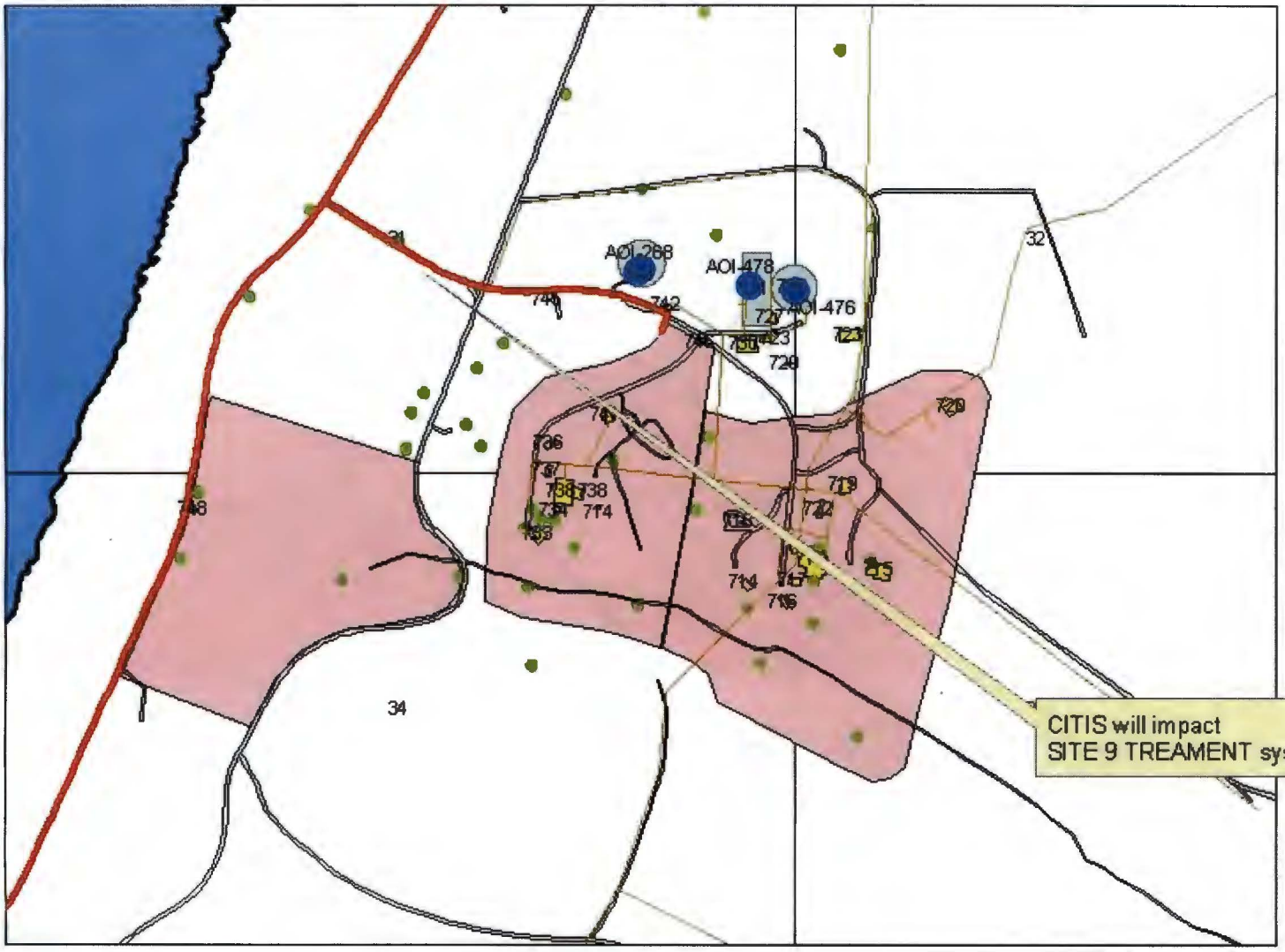
0 135 270 540 810 1,080 Feet

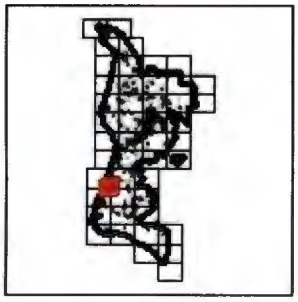
0 40 80 160 240 320 Meters

Map generation date: 3/16/2006

IRP Site 9 SPACE Launch

CITITS IMPACT





aoi_features
cits_all
water_arc
aoi
Edge of Pavement

TT Groundwater Monitoring Pts
Buildings

Status

Closed
Action Required
Open

Base Grid
VAFB Boundary

NAME

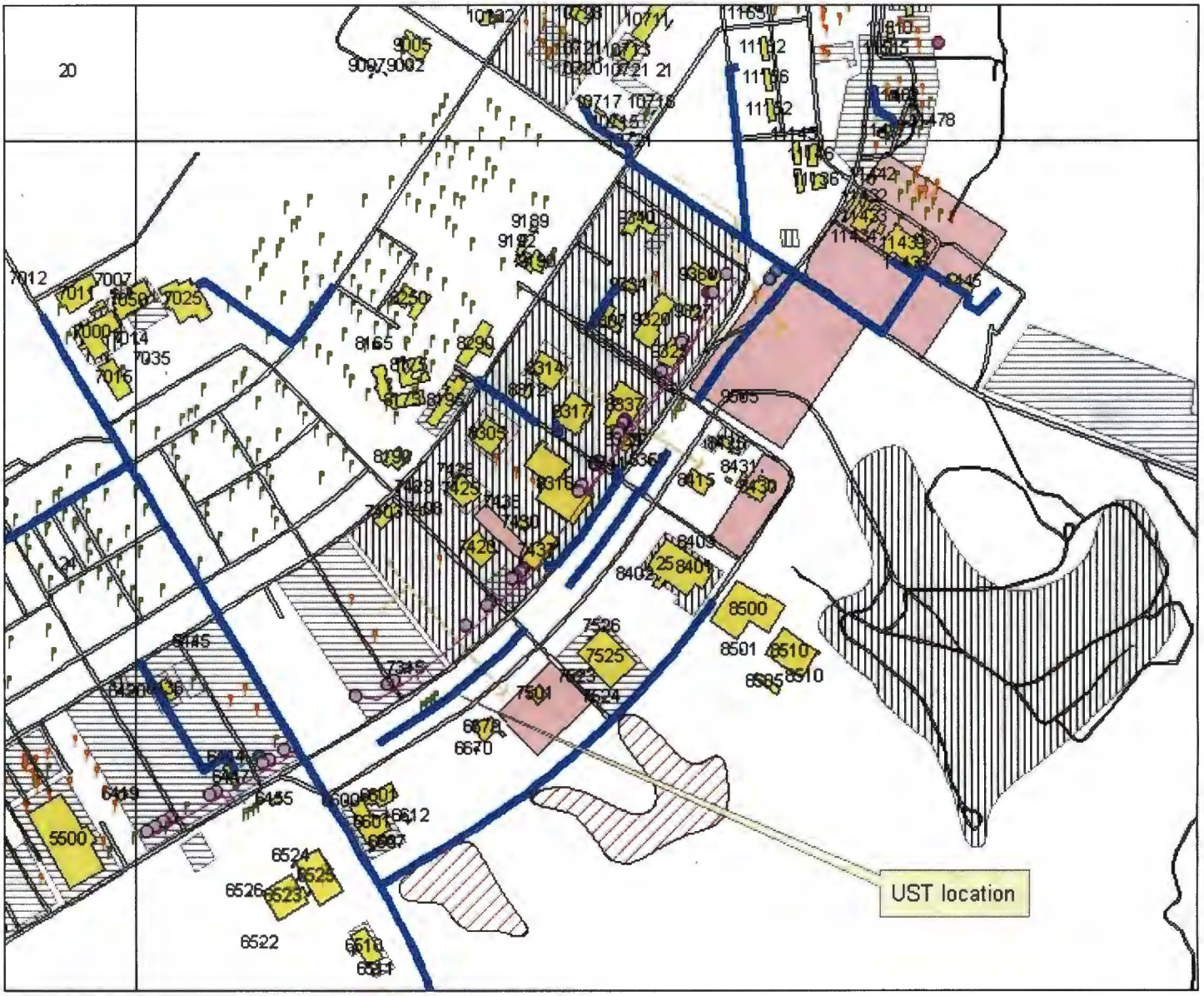
OCEAN
OFFBASE

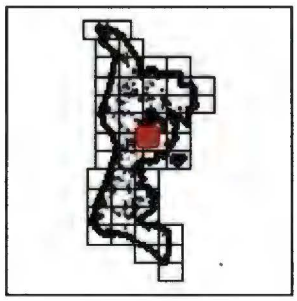
N
W E
S

0 395 790 1,580 2,370 3,160 Feet

0 115 230 460 690 920 Meters

Map generation date: 3/15/2006





clts_all
clts_all
Edge of Pavement
FH USTs
JE Surveyed USTs
MH Surveyed USTs
USBR USTs
Bldgs with Oil Fired Heat
Diesel Fueling Pump
Gasoline Fueling Pump
Gasoline Tank
Solvent Fueling Pump

Diesel Pipe
Gasoline Pipe
Solvent Pipe
Waste Pipe
Buildings

Status
Closed
Action Required
Open
Open
Closed

Base Grid
VAFB Boundary

NAME
OCEAN
OFFBASE

N
W
E
S

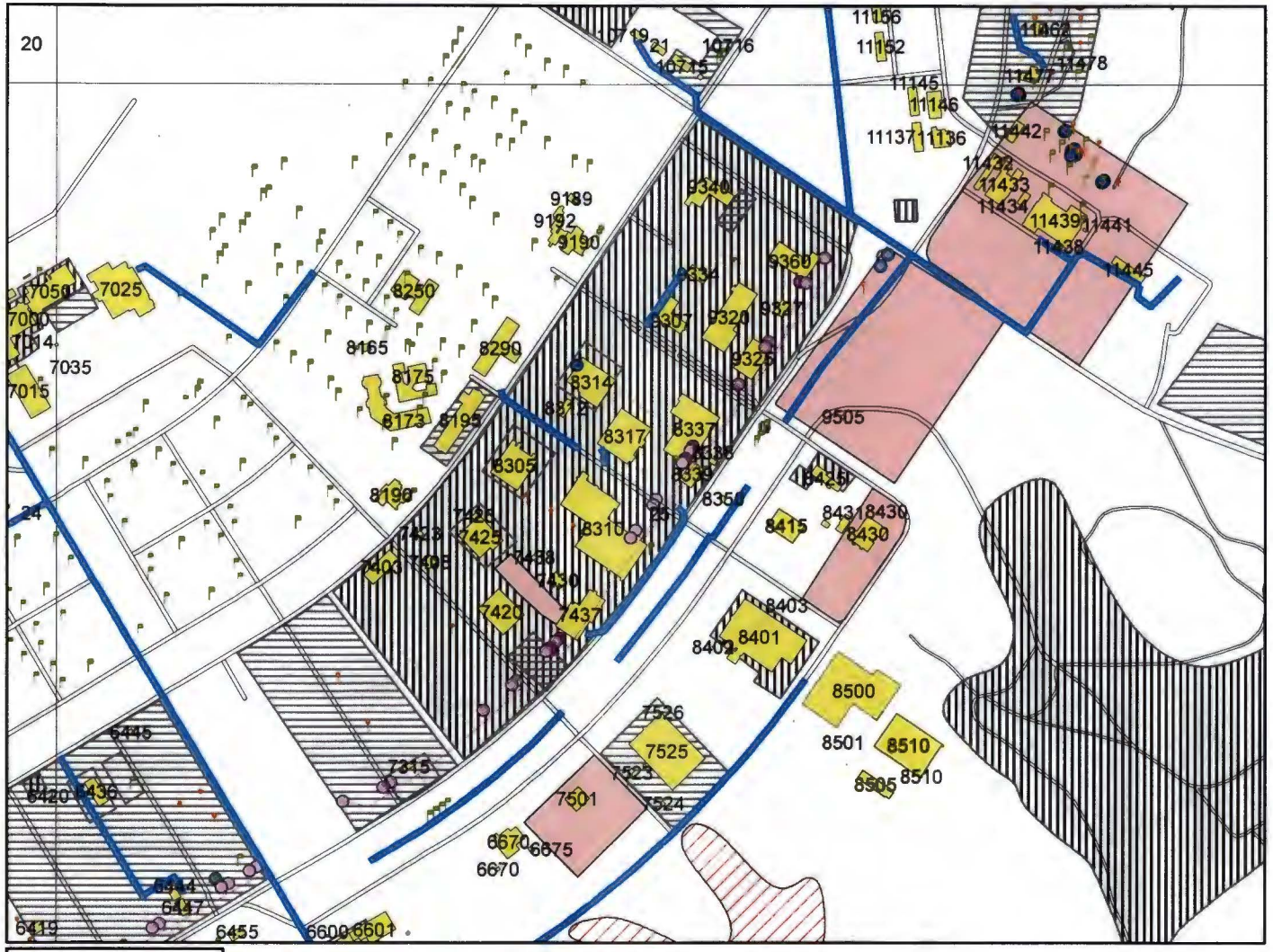
0 445 890 1,780 2,670 3,560 Feet

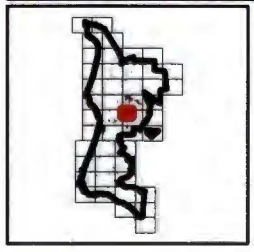
0 130 260 520 780 1,040 Meters

Map generation date: 4/20/2006

IRP Site 45

CITS line





N

W E

S

0 362.5 725 1,450 2,175 2,900 Feet

0 110 220 440 660 880 Meters

cits_all
cits_all
Edge of Pavement
FH USTs
JE Surveyed USTs
MK Surveyed USTs
USBR USTs
MK Boreholes 6/14-6/17/99
Bldgs with Oil Fired Heat
Diesel Fueling Pump
Gasoline Fueling Pump
Gasoline Tank
Solvent Fueling Pump
Diesel Pipe
Gasoline Pipe
Solvent Pipe
Waste Pipe
Buildings

Status

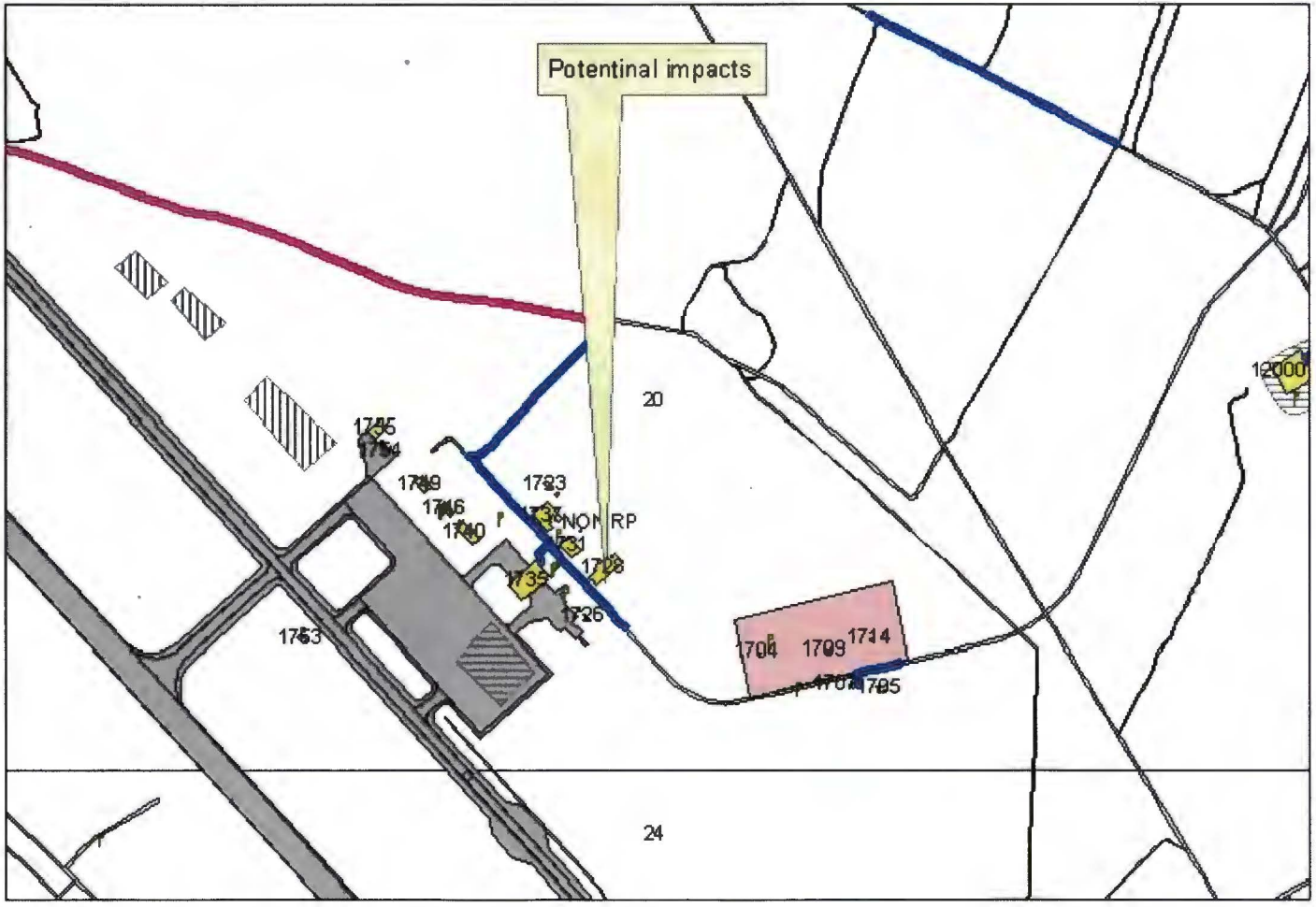
Closed
Action Required
Open
Open
Closed
Base Grid
VAFB Boundary

NAME

OCEAN
OFFBASE

Map generation date: 4/21/2006

Potentila Impacts



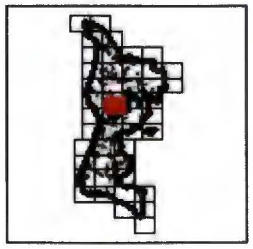
cits_all
cits_all
Edge of Pavement
FH USTs
JE Surveyed USTs
MK Surveyed USTs
USBR USTs
Buildings

Status

Closed
Action Required
Open
Open
Closed
Taxiway
Runway
Base Grid
VAFB Boundary

NAME

OCEAN
OFFBASE



N
W E
S

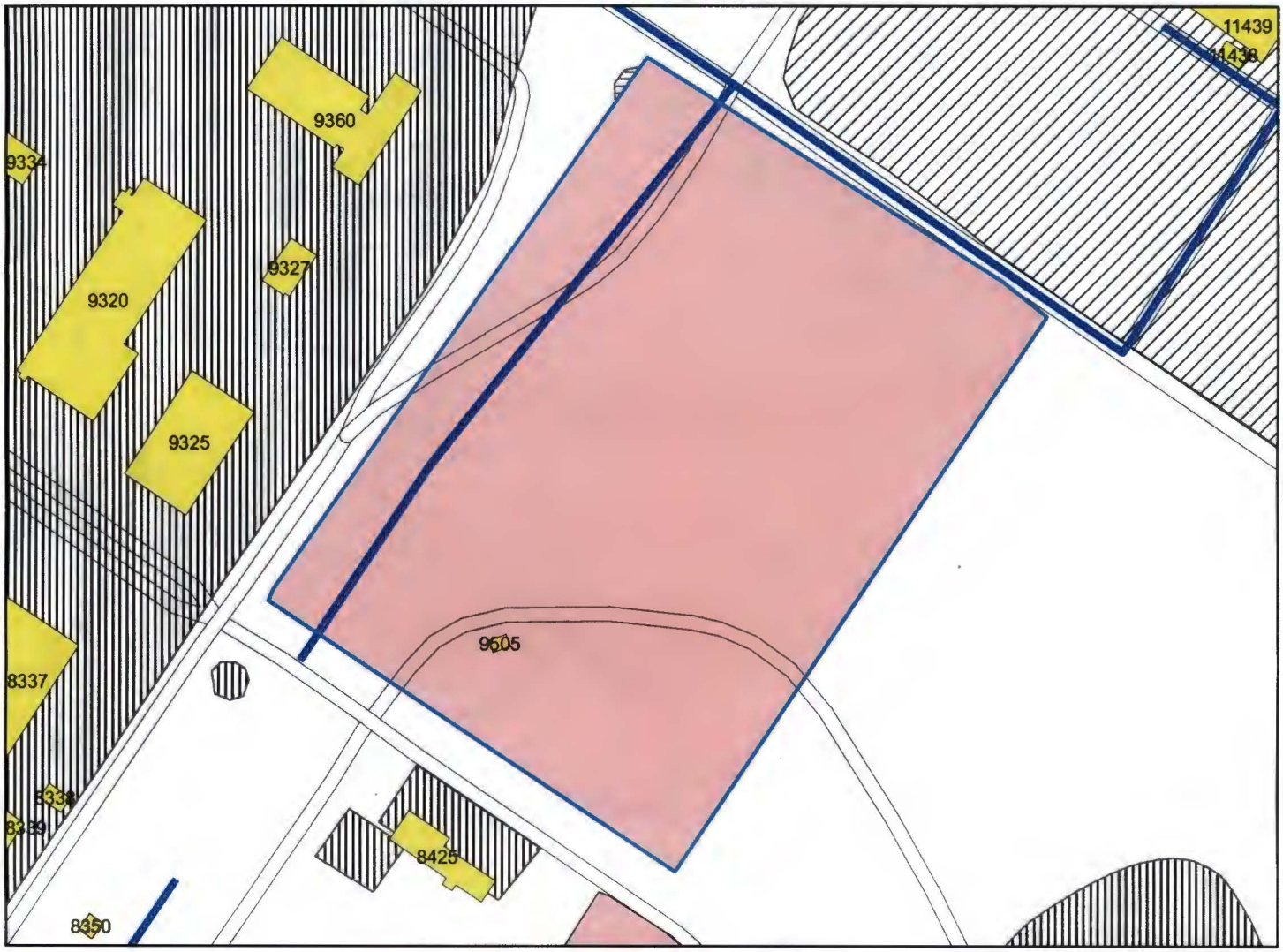
0 500 1,000 2,000 3,000 4,000 Feet

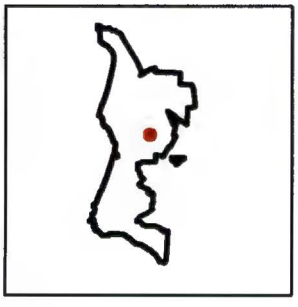
0 150 300 600 900 1,200 Meters

Map generation date: 4/20/2006

CITS Project

IRP Site 3





cits_all
Edge of Pavement
Buildings

Status

Closed
Action Required
Open

Open
Closed
VAFB Boundary

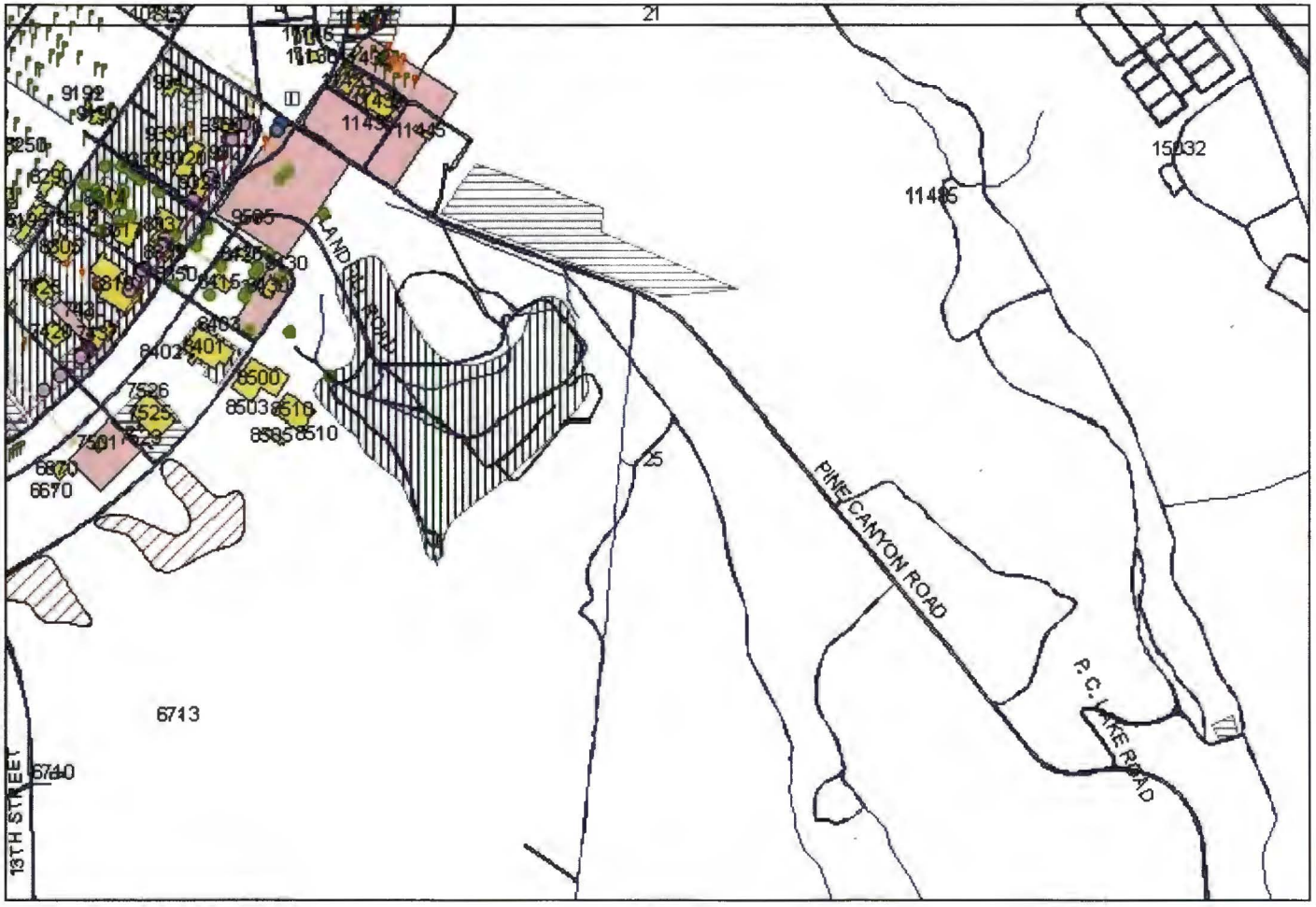
N
W E
S

0 105 210 420 630 840 Feet

0 30 60 120 180 240 Meters

Map generation date: 4/20/2006

Pine Canyon



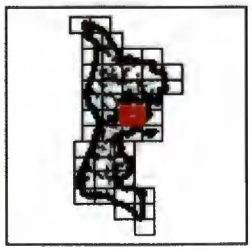
vafb_roads_arc
Edge of Pavement
FH USTs
JE Surveyed USTs
MK Surveyed USTs
USBR USTs
TT Groundwater Monitoring Pts
Bldgs with Oil Fired Heat
Diesel Fueling Pump
Gasoline Fueling Pump
Gasoline Tank
Solvent Fueling Pump
Diesel Pipe
Gasoline Pipe
Solvent Pipe
Waste Pipe
Buildings

Status

Closed
Action Required
Open
Open
Closed
Base Grid
VAFB Boundary

NAME

OCEAN
OFFBASE



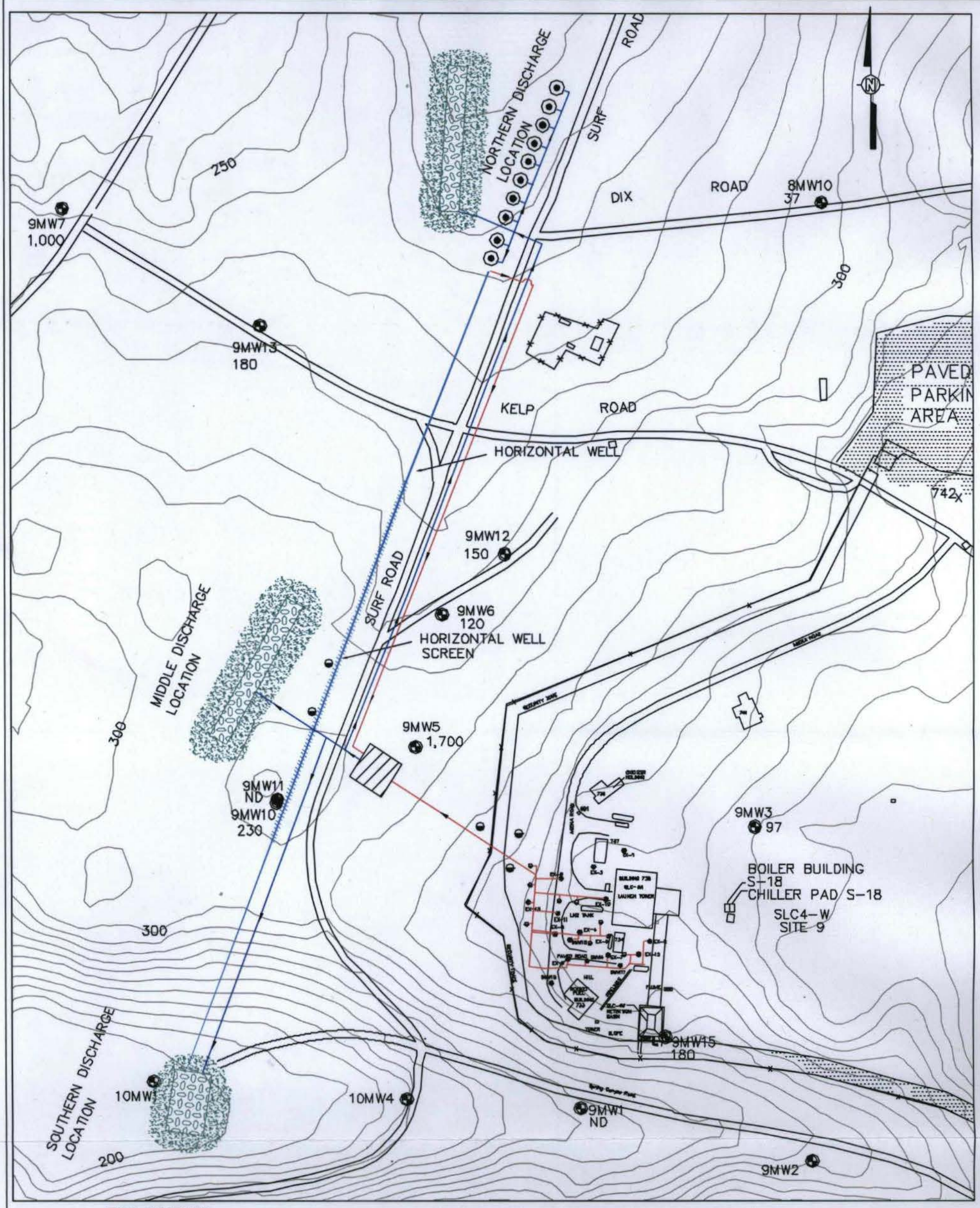
N
W E
S

0 650 1,300 2,600 3,900 5,200 Feet

0 190 380 760 1,140 1,520 Meters

Map generation date: 5/16/2006

DRAWN BY		CHECKED BY		APPROVED BY		DRAWING NUMBER	820087-B66
M. Schrage	9-21-01						



EXPLANATION

- 9MW-10 / 150 — MONITORING WELLS, TCE CONCENTRATION, MAY 2001
- PROPOSED WELLS
- SECURITY FENCE
- HORIZONTAL WELL SCREEN
- TREATMENT PAD LOCATION
- POSSIBLE INFILTRATION GALLERIES
- SURFACE DISTURBANCE AREA
- INFILTRATION BORINGS
- CONTAMINATED WATER PIPELINE
- TREATED WATER PIPELINE

SCALE
0 250 500 FEET

IT CORPORATION

AIR FORCE CENTER FOR ENVIRONMENTAL EXCELLENCE
CONTRACT NO.
F41624-97-D-8024

FIGURE 3

PIPING, TREATMENT, AND DISCHARGE PLAN
FOR EXTRACTED GROUNDWATER
SLC-4W, SITE 9
VANDENBERG AFB CALIFORNIA